Interpreting and technology

Edited by

Claudio Fantinuoli

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Chapter 1

Interpreting and technology: The upcoming technological turn

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1 Introduction

The topic of technology is not new in the context of interpreting. However, recent advances in interpreting-related technologies are attracting increasing interest from both scholars and practitioners. This volume aims at exploring key issues, approaches and challenges in the interplay of interpreting and technology, a domain of investigation that is still underrepresented in the field of Interpreting Studies. The contributions to this volume focus on topics in the area of computer-assisted and remote interpreting, both in the conference as well as in the court setting, and report on experimental studies.

To the best of my knowledge, this is the first book entirely dedicated to this subject. Its publication should not be considered a point of arrival in research work on interpretation and technology, but rather as an occasion to give new momentum to the analysis of a topic that is both current and complex. In this field further in-depth research is necessary in order to better understand the past and future impact of technology on interpretation, on the one hand, and to prepare future generation of interpreters to adapt to a constantly changing market, on the other.

2 Setting technology into the interpreting perspective

When compared to written translation or other language professions, the impact of the advances in information and communication technology on interpreting

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has been modest so far. In its long history, however, interpreting has not been immune to technological innovations. On the contrary, it has gone through at least two major technological breakthroughs with disruptive effects on the profession in both cases.

The first breakthrough was the introduction of wired systems for speech transmission that led to the rise of simultaneous interpreting (SI). First attempts in this direction were reported in the early '20s, with a patent filed by IBM and its adoption at the Sixth Congress of the Comintern in the former Soviet Union and at the International Labour Conference. This technology acquired broader visibility during the post war Nuremberg trials and was adopted since then in all international organizations. Although the cognitive process of translating while listening to the source speech was not new (chuchotage has been around forever), the invention of simultaneous interpretation equipment radically changed the way interpretation was delivered on a daily basis. This technological breakthrough also had an impact on the self-perception of interpreters. At the beginning, interpreters feared a loss of quality in their performance and perceived the relegation into interpreting booths and the need to abandon the stage they used to share with diplomats as a worsening of the prestige associated to the profession and, consequently, of their social status. In reality, the broad adoption of SI together with the increasing demand for interpreting services due to geopolitical changes in the second half of the 20th century led to a professionalization of the whole sector and, in turn, to a general improvement of the social status of interpreters.[1]

The second technological breakthrough that has affected interpreting practice is the Internet. The emerging of the World Wide Web in the '90s radically changed interpreters' relation to knowledge and its acquisition. Since preparation is one of the fundamental aspects of interpreting (Gile 2009), as it is crucial to fill the linguistic and knowledge gap between event participants and interpreters, the impact of this technology on the profession has been extraordinary. The Internet is the most comprehensive and accessible repository of textual material available in many languages and on many topics. Interpreters use it in a lot of different ways, for example to conduct exploratory research before they receive actual conference material (Chang et al. 2018) or to create specialized corpora for linguistic analyses (Fantinuoli 2017; 2018b; Xu 2018). As improper answering machines (Finn 2017), search engines have become the privileged door to knowledge. They are used to discern right from wrong, good from bad, or, in the limited scope of interpreting, to fill knowledge gaps, confirm translation hypotheses, find definitions, and so forth. Thanks to the undeniable advantages of

[1]For a brief history of interpreting, see for example (Takeda & Baigorri Jalón 2016).

having this wealth of information available with a simple click of the mouse, the Internet has become by right the most familiar working environment for translators and interpreters (Zanettin 2002). The Internet and digital devices, such as laptops and tablets, have also changed reading patterns. Differently form printed documents, which are commonly read line by line, digital documents are mostly scanned through in search for key terms or to get a general overview (Pernice 2017). Since there is evidence that this change in reading behavior influences aspects of learning such as recall, comprehension and retention of knowledge (Ross et al. 2017), it is reasonable to assume that the digitization of information has had consequences on interpreting and its underlying subprocesses, especially in the pre-event phase of preparation. The magnitude of this change, however, is still not completely clear as there is very little academic research on the topic.

Currently, interpreting might be on the verge of a third breakthrough which I will call, for lack of a better term, the technological turn in interpreting. Bigger of one order of magnitude if compared to the first two breakthroughs, its pervasiveness and the changes that it may bring about could reach a level that has the potential to radically change the profession.[2] Not only could this lead to a transformation of the interpreting ecosystem in all its complexity, but it is reasonable to assume that it may have a significant impact on many social aspects related to the profession, from the way it is perceived by the general public to the status and working conditions of interpreters. In order to explore the reasons for and the potential consequences of this technological turn, it is first necessary to briefly introduce the interpreting-related technologies that lie at the core of this discussion.

3 Types of interpreting-related technologies

There are three main technologies that will play a central role in this technological turn: computer-assisted (CAI), remote (RI), and machine interpreting (MI).

Computer-assisted interpreting can be defined as a form of oral translation in which a human interpreter makes use of computer software designed to support and facilitate some aspects of the interpreting task with the goal to increase quality and productivity (Fantinuoli 2018a). Among others, CAI tools are designed to

[2] Referring to Hegel, Galimberti affirms that "When a phenomenon grows quantitatively, there is not only an increase in quantity, but there is also a radical change in quality. Hegel provides a very simple example: if I pull out one hair, I am one who has hair, if I pull out two hairs I am one who has hair, if I pull out all of my hair I am bald. There is, therefore, a qualitative change for the simple quantitative increase of a gesture" (2009) (translation by the author).

assist interpreters in the creation of glossaries thanks to a wide range of terminology resources, to look up terms in the booth, and to extract useful information from preparatory documents to name but a few. They can make use of advanced Natural Language Process features, such as automatic terminology extraction, key topics identification, summarization, automatic speech recognition, and so forth.[3]

The most evident reason behind the creation of CAI tools is the desire to improve the interpreters' work experience, by relieving them of the burden of some of the most time-consuming tasks (such as creating and organizing terminology) and by supporting them in carrying out numerous activities, from the retrieval of preparatory documents to their analysis in a way appropriate to their profession. By improving the working experience of interpreters, both during preparation and during the very act of interpreting, CAI tools ultimately aim at improving the quality of the interpreting performance. CAI tools are specifically designed to meet the specific needs of interpreters from the pre- to the post-conference phase, independent of the interpreting modality. Being an integral part of the interpreting process (suffice it to think of the most extreme case of accessing terminological information during simultaneous interpretation), they are directly linked to and may have an influence on the cognitive processes underlying the central tasks of interpreting.

Remote interpreting RI is a broad concept which is commonly used to refer to forms of interpreter-mediated communication delivered by means of information and communication technology. It is not a monolithic concept, but it can rather be used to designate different settings and modalities, for example when all event participants are gathered at one place while the interpreters are located at a different venue, or when the interpreter and one of the interlocutors are both present at the same place. As far as technology is concerned, RI can be carried out thanks to different solutions, from simple telephone to advanced videoconference equipment.

Up until now RI has been used mainly to provide remote consecutive interpreting services, for example in the healthcare or judicial sector, while in other contexts, such as conference interpreting, RI has been scarcely deployed.[4] The limited adoption of RI has to do both with limitations of the technologies available and with the complex cognitive and communicative processes underlying interpreting. Tests conducted on remote simultaneous interpreting, for instance, have highlighted, among others, issues in the quality of the audio/video signals,

[3] See for example **Fantinuoli2017b** and Stewart et al. (2018).

[4] One notable exception is the use of RI in television interpretation.

the partial loss of contextual information due to remoteness, and psychological factors, such as fatigue, higher levels of stress and loss of motivation and concentration. In the area of consecutive interpreting, issues like turn taking, alienation and stress have been found to be particularly significant.[5]

Technological progress is, however, removing technical barriers to remote interpretation and it is making RI interesting for many stakeholders. The increasing demand for liaison and consecutive interpreting services, for example for refugees, has already led to the adoption of this technology by many public institutions, while in the context of conference interpreting, empirical tests have demonstrated that, despite the resistance of professionals, it is possible to perform remote simultaneous interpretation RSI without breaching professional associations' codes for the use of new technologies in interpretation, ISO standards or other related norms applicable to interpretation (Causo 2011: 202). The number of enterprises offering platforms for remote interpreting both in form of solutions for home offices and in form of interpreting hubs, i.e. professional environments with booths, high-quality consoles, technicians, etc., has dramatically increased in the last few years.

Machine interpreting (MI), also known as automatic speech translation, automatic interpreting or speech-to-speech translation, is the technology that allows the translation of spoken texts from one language to another by means of a computer program. It combines at least three technologies to perform the task: automatic speech recognition (ASR), to transcribe the oral speech into written text, machine translation (MT) often with some auxiliary technologies, such as segmentation and punctuation prediction, and speech-to-text synthesis STT, to generate an audible version in the target language.

MI is a technology that aims at replacing human interpreters and is in this respect very different to the other two interpreting-related technologies, since they are designed to assist human interpreters in their work (CAI) or to change the way they deliver their services (RI). Although automatic speech translation is still very far from achieving the level of quality of human interpreters, considerable improvements have been made over the last few years. This is due to the latest developments in several machine learning technologies. ASR based on neural networks is quicker and more precise than ever, and it allows the transcription of spoken words even without training, while machine translation has reached unprecedented quality in terms of precision and fluency of the target language output. First prototypes have been used in specific settings, such as the real-time automatic speech translation system for university lectures implemented at the

[5]For a bibliographical overview, see Andres & Falk (2009).

Karlsruhe Institute of Technology (Müller et al. 2016), or have been brought on the market by technology giants, such as Google (Pixel Buds) or Microsoft (Skype Translator).

The success of these systems has been quite modest so far as they fail to achieve the goal of quality and usability even for the most basic real scenarios in which interpreting is needed. The creation of machine interpreting systems is so challenging for several reasons, both at a technical and at a communicative level. On the technical side, quality of AT and issues in the latency and flexibility of speech recognition as well as noise tolerance and speaker independence, to name but a few, exponentially increase the sources of errors and inaccuracies. On the communicative side, MI systems suffer from not being able to work – as yet - with cotext and context or to translate all the information that is not explicitly coded verbally, such as the speaker's attitude, world references, etc. However, the growth of machine learning and improved machine performance is producing encouraging results in many of the above mentioned and in other related areas. In the near future new applications, for example in the context of sentiment analysis, attitude identification, and so forth, could be integrated into MI to increase its quality, making it more "intelligent" and more similar to its human competitor.

4 The upcoming technological turn

There is some evidence that the profession is heading towards a technological turn. On the one hand, the interpreting-related solutions brought about by new advances in information and communication technologies as well as in natural language processing are growing in number, and the speed of change is significantly faster than it was in the past. In the three areas indicated above, companies are investing time and effort in order to launch an ever increasing number of software and devices on the market, thus reacting to users' demands but also creating new ones.

On the other hand, the interest of interpreting studies for technological matters, especially for RI,[6] as well as the presence of technology in interpreter train-

[6] A bibliometrical analysis reveals that the vast majority of publications on the topic of interpreting technologies is dedicated to remote interpreting which, in many cases, is what authors actually refer to when they speak about technology. Only recently, the number of papers about computer-assisted interpreting has increased. On the contrary, the subject of machine interpreting from the perspective of interpreting studies seems to be completely missing in the contest of interpreting.

ing are gaining momentum, indicating some degree of awareness is spreading in regards to the importance of technological development to interpreting.

More important, however, is the fact that interpreting is caught up in fundamental and pervasive changes of the labor market due to technological developments, in particular to digitalization and automation, which are creating new patterns of work organization (Huws 2016; Neufeind et al. 2018). Interpreting is not immune to these developments. Notwithstanding the relative small economic impact of the interpreting sector,[7] the pressure to embrace new technologies may soon increase. Not only the market, but also society, which, as Besnier points out is literally obsessed with technology (2012), may have enough persuasive power to impose new technologies on the profession, no matter the personal attitudes towards them, the potential consequences on quality, working conditions and so forth. If this development is quite unproblematic in the area of CAI tools, as their use will have consequences only on some (micro)processes of the interpreting activity, but not on the labor market, the impact of both RI and MI may be significantly different. Nobody knows what the impact of these technologies on the medium and long run might be. RI may, for instance, offer new opportunities for work in new market segments, leading to a productivity effect,[8] but it could also lead to the opposite effect. In fact, interpretation – as many other professions of the tertiary sector – may soon have to face a process of commoditization, fostered by modern paradigms of labor organization, such as outsourcing (which is already the norm in the language sector) and intensified by the adoption on a larger scale of new interpreting-related technologies. It is plausible to think that RI, at least in some market segments, it will bring about a partial depersonification of the service provider which will foster the tendency to hire interpreters at last notice, irrespective of their suitability or skills for a specific job. When services become more uniform from the buyers' point of view, they tend to buy the cheapest, initiating a downward spiral of economic decline and, ultimately, deprofessionalisation of the industry. It is probably for this reason that interpreting technologies have been traditionally welcomed with a general attitude of aversion and skepticism by professionals (Pym 2011). This hostility generally takes the form of arguments in defence of quality, in the case of RI, or simply of the thesis of the sheer absence of need for any support in the complex interpreting

[7] Suffice it to compare interpreting with the written translation industry to see the importance of economic aspects in technology adoption. The cost-cutting potential of CAT tools in the '90s and, more recently, of machine translation in the translator's workspace have forced the large-scale adoption of such tools, irrespective of the personal attitude of translators towards these innovations.

[8] An increase of the demand for labor that arises due to technological progress

process, in the case of CAI. Its real motivation is, however, the natural feeling of insecurity and fear of technologically induced unemployment and, consequently, the need to pursue a legitimate and strategic goal, the defence of the interests of the category.

To further worsen this hypothetical scenario, the changing perception of the profession by the general public due to advances in natural language processing, especially in machine interpreting, will probably accelerate the process. Indeed, machine interpreting is still in its technological infancy at the moment of writing and the limits of current implementations are clear. Nonetheless, it has made considerable improvements over the last few years. There is no doubt that the fast evolution of this technology will have both a long-term impact in some areas of the profession and a short-term impact in the public perception of the activity performed by professional interpreters. This, in turn, may under certain circumstances undermine the status of the profession well before the time they will actually represent a potential threat to interpreters.

Paradoxically, a balanced and responsible adoption of technologies could be fruitful to reverse such negative trends. Looking at the broader picture, the most promising approach for our society as a whole seems to be to use the technological advances for the benefit of the workers. Research is currently directed to anticipating future trends, enabling to prepare society for the disruptive change and harness the potential of digital technologies. The same applies to interpreting. In order to reap the benefits offered by technology and not to be dominated by it, a better integration of technologies in the profession has pursued vigorously. To do so, deeper understanding is needed of the intersection of technology and interpreting in the three areas indicated above. This inquiry should not be conducted merely from the interpreter's perspective (self-perception), albeit it remaining a crucial side in the debate, but it should also consider the external point of view of a variety of stakeholders and encompass considerations of different nature, such as socio-economic, etc. This requires the development an open-minded attitude towards technology and the ability to rethink the profession as we know it today, on the basis of empirical evidence, new ideas and the awareness about the direction that market, society and technological developments are heading to. A better understanding of these developments could make a potential transition easier and mitigate potential concerns. This book is a small contribution in this direction as it offers evidence, practical suggestions and proposals that may help the interpreting community to positively cope with the upcoming challenges. All its chapters present empirical research in two areas of technological innovation which may have a greater impact on the daily working conditions of interpreters in the immediate future, namely computer-assisted and remote interpreting.

5 Overview of the individual contributions

The book opens with two seminal chapters in the research area around CAI tools and should stimulate scientific and practical discussion on the role of technology use during interpreting. Desmet, Vandierendonck and Defrancq present a pilot study on the potential impact of CAI tools that support the interpretation of numbers. The authors set up a mock-up system to simulate technology that automatically recognizes numbers in the source speech and presents them on a screen in the booth. The study experimentally shows that CAI tools may have the potential to reduce the cognitive load during simultaneous interpreting and improve quality. The issue of finding the right framework to study the impact of CAI tool on the interpreter delivery is pivotal in Prandi's chapter. In her exploratory study, she evaluates the appropriateness of the stimuli adopted for data collection and describes the theoretical framework she chose to conduct the experiment. The final goal of this research project, still underway, is to verify whether the use of CAI tools in the booth causes saturation or, on the contrary, helps prevent it by reducing the cognitive load during terminology search and delivery of a terminology-rich text. The preliminary results derived from the analysis of the test subjects' interpretations seems to indicate that the use of a CAI tool, under specific circumstances, may increase output quality.

Deysel and Lesch focus on CAIT and explore the use of such tools to develop self-assessment skills in the performance of professional interpreters working in the National Parliament of the Republic of South Africa. The research design for this article comprises an evaluation study approach, based on an experimental design that considers the exposure to CAIT for purposes of self-assessment. In order to collect data to address the research questions, a questionnaire, an experiment and interviews were used. The experimental group was exposed to the software, Black Box, in order to measure its impact on the development of their self-assessment skills. The results show that the experimental group of practicing interpreters which were exposed to the software indicated a better understanding of the criteria which are important in the assessment of interpreting performance as well as a greater awareness of the strengths and weaknesses of their performance.

Devaux's chapter explores practicing court interpreters' perceptions of their role in England and Wales when they interpret through videoconferencing systems. The author empirically approached the subject conducting semi-structured interviews with eighteen participants. The data gathered was analyzed through the innovative theoretical framework of role-space. The results show that the use

of technology, unlike in face-to-face court hearings, makes some interpreters perceive their role differently and forces them to create split role models. The use of videoconferencing equipment affected various aspects of their presentation of self, participant alignment, and interaction management. The chapter ends with some recommendations for training court interpreters derived by the experimental results.

Finally, Ziegler and Gigliobianco address the use of remote interpreting in the simultaneous mode. After analyzing the terminological challenges and presenting the basic literature on the topic, they give a detailed overview of the state-of-the art of RI, the technical requirements required for remote interpreting and the relevant international norms. They then introduce a pilot experiment aiming at testing the feasibility of using augmented reality in order to overcome some of the perceived limitations of RI, i.e. exclusion and lack of visuality. The idea of interpreters working and being in control of what the camera(s) show them is certainly attractive and it may trigger research into new interpreting technologies applied to remoteness.

6 Conclusions

There seem to be signs of a new technological breakthrough approaching interpreting, yet not enough research and discussion is devoted to the actual consequences for the profession, both in the short and in the long term. There is an urgent need to understand how technology is disrupting the way interpreters work and to explore the broad terrain of private actions, public policies, and professional dialogue needed to ensure that technological advancements can be shaped to the benefit of interpreters.

It is the hope of the editor that, through this publication, interpreting scholars and professionals will embrace further research in these exciting areas of interpreting studies, exploring new topics at the intersection of technology and interpreting and, in doing so, contributing to preparing the profession to successfully face the upcoming technological turn in interpreting.

The introduction will be provided in due course.

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Interpreting and technology

Unlike other professions, the impact of information and communication technology on interpreting has been moderate so far. However, recent advances in the areas of remote, computer-assisted, and, most recently, machine interpreting, are gaining the interest of both researchers and practitioners. This volume aims at exploring key issues, approaches and challenges to the interplay of interpreting and technology, an area that is still under-represented in the field of Interpreting Studies. The contributions to this volume cover topics in the area of computer-assisted and remote interpreting, both in the conference as well as in the court setting, and report on experimental studies.