ISSN: 1579-9794

SIN-WAI, CHAN. ROUTLEDGE ENCYCLOPEDIA OF TRANSLATION TECHNOLOGY, 2ND EDITION. OXON/NEW YORK, ROUTLEDGE, 2023, 834 PP., 978-0-367-76736-5

Acknowledging that translation technology has brought about "fundamental changes and additional dimensions to all aspects of the contemporary world of translation" (p. xxxi), this encyclopaedia aims to serve as a key reference of fundamental concepts related to translation technology and of the research undertaken in this field. Given the fast pace at which technology evolves and the numerous developments involving the use of artificial intelligence (AI) in translation since the beginning of the 2020s, the publication of this second edition, which follows a first edition dating back to 2014, comes with updated content and five new chapters, making it therefore particularly relevant and topical.

With a total of 47 chapters or entries, this collective volume is particularly welcome considering the scarcity of general and non-research focused monographs on translation technology. Austermühl (2001), Bowker (2002) and Quah (2006) became key reference works on translation technology in the 2000s and the early 2010s, yet we have had to wait until recently to read a similar publication, such as the textbook authored by Rothwell et al. (2023). Recent contributions of a more general nature are less generic and more focused on specific technologies, scenarios and types of translation (see, for example, Bolaños García-Escribano, 2025). Given that many of the aspects covered in works on translation technology will inevitably become dated, in current works the focus is often placed on key concepts and technologies, and how they have been implemented in representative tools (e.g. authors might choose a tool like memoQ to explore concepts related to translation memory (TM) tools).

This is also the approach taken in Sin-wai's edited work, especially in **Part 1**, where general issues and topics within translation technology are discussed. While there is a strong emphasis on machine translation (MT) in this part, with 8 out of 15 chapters being devoted to this type of translation technology specifically, sizeable attention is also paid to the wider notion of computer-aided translation (CAT) and its training. Although at times it is not clear whether MT is seen as a type of CAT or rather as a technology that pursues full automation of the translation process, this part attempts to clarify the terminological confusion surrounding the very concept of CAT, including detailed definitions of key notions. Readers will also find compelling reflections on how the different types of translation technology and resources needed to operate these are related to each other. Some chapters delve into the concept

of localisation and localisation tools within translation technology, with the focus often being placed on software localisation and, to a lesser extent, on web localisation, thus missing the opportunity to introduce media localisation, a field nevertheless explored in part 3. Despite not having been updated since the first edition, Chapter 3 is of particular interest. Authored by Garcia, this entry distinguishes between classic and more current CAT systems and discusses interesting concepts with a focus on TM and terminology management.

Within Part 1, one of the most valuable chapters is Bowker's, which is articulated around key questions in relation to translation training, such as why translators need to learn about translation technologies, which types of tools are relevant to practitioners and which ones should be included in the curriculum. Bowker provides an updated overview not only of key challenges in translation training but also of current tools and technologies in professional environments. When compared to the first edition, it becomes clear that this chapter has been revamped to include topical aspects such as the need to consider ergonomic design or to address ethical issues as regards the use of translation technology in the translation classroom, as well as the role of neural MT (NMT). Despite some obvious overlaps, a new and welcome addition is the chapter entitled 'Teaching translation technology', authored by Chan and Shuttleworth, which complements Bowker's chapter by discussing different approaches and methodologies to teach translation technology. In doing so, the authors refer to up-to-date empirical studies, with a refreshing section devoted to the effectiveness of translation technology teaching.

A further and important addition to the second edition in Part 1 is the chapter on AI in translation authored by Xueting and Chengze. Together with chapter 47 on deep learning and translation technology (see below), this chapter bears the responsibility of providing an overview of new developments in translation technology, exploring key notions and implementations of deep learning, machine learning and AI in translation. Although their chapter seems to focus widely on NMT, Xueting and Chengze also illustrate how AI has previously been used in other MT models or approaches that have now been superseded by NMT. Previous MT models are covered in detail in other sections of the encyclopaedia such as rule-based MT (RBMT) (see chapter 10), example-based MT (EBMT) (see chapter 7), or statistical MT (SMT) (see chapter 11). AI, understood by the authors as a "field of studies that enables computers and machines to mimic the perception, learning, problem-solving, and decision-making capabilities of humans" (p. 280), can be implemented in translation-related tasks in many ways and not solely to achieve full automation of the translation process. For example, AI can be used to automate or at least streamline specific stages of the process (e.g. the

documentation undertaken by translators or the quality control by reviewers), as well as for translation-related tasks such as automatic speech recognition (ASR). However, the focus of this chapter is mostly on MT. Other applications are nevertheless discussed in chapter 47, which places greater emphasis on deep learning as a form of machine learning, "which is in turn an approach to artificial intelligence" (p. 797).

Given the predominance of NMT in current times, the relevance of some of the chapters on MT included in this part may appear limited in scope. This is particularly true for approaches that have not been consolidated (see chapter 9 on pragmatics-based MT). However, these discussions are indeed essential for readers to understand how the field of MT has evolved over time (see for example Hutchins's chapter on the history of research and applications of MT) and why specific approaches became more prominent within specific time periods, contexts and environments.

Context and environments gain prominence in **Part 2** of this encyclopaedia, which illustrates "the development and application of translation technology in different social and cultural situations and at different levels of technological advancement" (p. xxxv) in diverse countries and regions. Although the rationale for choosing some regions over others has not been clearly argued and some continents are not represented (i.e. South America), praise should be given to the editor's attempt to provide a global perspective and showcase development in regions not often reported in the mainstream literature on translation studies in general and translation technology in particular, with a wide and diverse coverage of Asian regions.

In this section of the encyclopaedia, authors have adopted diverse approaches, with some chapters focusing on research and others paying attention to professional practices. For instance, the reflections on how technology has evolved in Canada based on Macklovitch's personal experience as a translator at the Canadian Translation Bureau are particularly insightful, showing how some of the then-new tools such as word processors and terminology banks have hitherto maximised translators' efficiency. His arguments on the potential of automatic speech recognition (ASR) are particularly compelling. Through a series of consultation sessions undertaken in 2011, the author was surprised to find out that many employees of the federal translation bureau still used a Dictaphone to dictate their texts, thus highlighting the potential that ASR could have if it were to be integrated in their translation workflow. Yet, Macklovitch argues that ASR performance is still not suitable, both because "word error rates remain too high to allow automatic dictation to be cost effective" (p. 325), especially in languages other than English, and because ASR systems are not yet satisfactorily integrated with the tools often used by translators (particularly TM systems). Although some

of these issues remain in the 2020s and performance is likely to vary between languages, the situation has improved considerably (see Zapata et al., 2023) thanks to some of the developments on deep learning and speech translation, further discussed in chapter 47 of this encyclopaedia.

In chapter 22, Chung-ling also attempts to reflect the views of professionals, but in a more systematic manner, even undertaking an empirical investigation to report on the application and teaching of translation technology in Taiwan. In addition to identifying key trends from the data gathered, the author proposes concrete and useful suggestions to improve the situation and address the weaknesses identified, such as offering joint lectures and on-the-job training on translation technology or providing government incentives to boost the growth of the localisation industry in Taiwan. Despite being specific to Taiwan, many of these suggestions arise from in-depth reflections and are thereby applicable to other contexts, thus making this chapter a highly valuable contribution.

The remaining chapters from this section also uncover many other region-specific peculiarities such as the paradox of languages being under threat in a global economy such as the UK, where translation technology has certainly thrived in the past (see chapter 24 by Declercq), or DeCamp's portrayal, in chapter 25, of MT as an obsession in the US, "not only in universities and development labs but also in the general public" (p. 423). In addition to referring to how MT has been portrayed in influential books, television shows and films (namely, the universal translator in *Star Trek* or C-3PO in *Star Wars*), DeCamp reflects on how the use of technology was affected by socio-historical events throughout history (such as 9/11 or the Covid-19 pandemic), offering an incredibly informative timeline of the history of translation technology in the US at the end of her chapter. Other chapters focus on language-specific issues such as the challenges of working with Japanese using translation technology in general and MT in particular (see chapter 20 by Isahara) or the issues experienced in MT development for the many languages spoken in South Africa due to resource scarcity (see chapter 21 by van Huyssteen et al.).

Far from providing an overview of all regions across the globe, which would be an impossible endeavour for a publication of this nature, Part 2 succeeds in offering a snapshot of different practices in an array of contexts, with varied restrictions and circumstances. These chapters are well suited for a project of this scale, and the reader will therein find key information, including similarities and differences between regions, as far as the development of translation technology is concerned.

With 22 entries, three of which constitute new additions, **Part 3** introduces specific topics in translation technology. Some of these refer to key aspects or processes within natural language processing (NLP) such as part-of-speech tagging, segmentation or information retrieval and text mining. Some chapters, nevertheless, seem to be more generic, such as chapter 37 (localisation), chapter 38 (NLP), chapter 43 (subtitling) or chapter 47 (deep learning and translation technology). Attention is also paid to key resources for translation technology tools, such as corpora (chapter 31) or TM (chapter 45), as well as translation management systems (chapter 46). In addressing key concepts and applications, this section brings to the fore phenomena and practices that had been described as recent or future developments in Chapter 1 by the editor of this encyclopaedia, and which include crowdsourcing (see chapters 39 and 43, among others) or the prominence of cloud-based translation technology (see chapters 33, 43 and 46).

Probably due to the significance that post-editing (PE) has acquired over the past decade in the translation industry, considerable attention is directed towards editing in translation technology in general (chapter 32), editing in audiovisual translation (chapter 33), and MTPE (chapter 34). These last two chapters are very relevant additions. Chapter 34 complements chapter 32, which already includes a section on PE. In addition to providing relevant definitions and an overview of guidelines and types of PE, as well as a summary of research findings on aspects such as PE productivity and effort, chapter 34 includes very interesting reflections and suggestions on the skills needed to become a successful post-editor. Considering both the surge that AVT has experienced in recent decades and the specificities of subtitling, the inclusion of chapter 33 is a welcome gesture which complements existing encyclopaedia entries on AVT and technology (see Baños, 2018 or Díaz-Cintas and Massidda, 2019). As the authors argue, the complexities of editing tasks – whether human or machine-generated – are often greater in AVT in general, and subtitling in particular, as they involve both linguistic and technical editing. Indeed, Bolaños García-Escribano and Declercq identify at least 6 types of editing that are often performed in subtitling before, during or after the translation process (namely, pre-editing, post-editing, revision, proofreading, quality assurance or quality control, and post-quality control viewing), as well as a supra-editing AVT-specific type of editing that can appear at any point of the editing process (e.g. truncation).

Chapter 47, also a new chapter of this second edition, not only illustrates the dramatic changes that deep learning has brought about to NLP but also helps readers to understand how some of the technologies and processes explored in Part 3 (e.g. MT, ASR, speech synthesis, sentiment analysis or text classification, among others) have been affected by such

developments. The subsections on the impact of deep learning on intersemiotic translation and translation memory are of great relevance, as is the final discussion of trends that propel the advancement of deep learning for translation and cross-lingual communication according to the authors. Large language models, which are widely popular in the translation industry at the time of writing, are briefly mentioned in this chapter, especially in relation to those developed by Open AI (i.e. GPT). Xueting and Chengze refer to GPT-3 as both an "enormous" (p. 283) NLP processing system and a "recent transformer model for text generation" (p. 300).

In addition to the breadth of topics covered, one of the main strengths of this publication is that it capitalises and reflects on the work of many scholars and specialists who work on and with translation technology in varied settings and environments. Among them are authors who once undertook pioneering research in this field and have thus become household names immediately associated with translation technology (such as Bowker, Hutchins or Melby, to mention but a few).

While some chapters may appear too technical and therefore targeted at expert users or readers already familiar with a specific technology (see, for example, chapter 26 or 35), many others succeed in providing a clear, easy-to-understand overview of key concepts for a wider audience while also introducing more technical aspects for more experienced readers. An example of this style is the chapter authored by Forcada (chapter 8), on free/open-source MT, which provides very clear and useful explanations of how different MT approaches work in addition to exploring the differences between commercial, free/open-source MT and non-free, open-source MT. Despite including complex technical information, the chapter authored by Sánchez-Martínez (chapter 40) masterfully explains how part of speech (PoS) taggers work, introducing them as programmes that attempt "to assign the correct PoS tag or lexical category to all words of a given text" (p. 702). This chapter also explores how PoS taggers are widely used in NLP applications such as MT, with a focus on RBMT and SMT.

As regards coverage, readers might be surprised not to find specific chapters on either NMT or speech recognition. While such chapters would have been very welcome, NMT is widely covered in chapters 15 and 47, as the editor rightly argues in the preface to this second edition. A substantial section on speech recognition is also included in chapter 42 on speech translation.

As regards organisation of content, readers might find that the distribution of the chapters can be slightly confusing. Indeed, although the volume has been divided into three parts, chapters are not always presented

following a specific logic. For instance, Part 3 seems to have been organised largely alphabetically, according to the name of topic covered, with the exception of the new chapters, resulting in some inconsistencies. Additional inconsistencies might also be found in the presentation of information in this second edition and while many could likely have been addressed through more detailed proofreading and editing, they are also to be expected in a work of this extent and scope.

As explained in the editor's preface, entries act as independent chapters and authors have clearly been granted substantial freedom to approach their work as they considered appropriate, which brings a novel angle and diversity to this book. Nevertheless, at times a more systematic approach would be desirable in a reference work of this kind. For instance, readers would probably appreciate finding an introduction and conclusion in each entry, and perhaps a section with useful references and resources (which has been included on occasion, but not methodically). As already mentioned, there seems to be a slight imbalance as regards which of the entries included in the first edition have been updated. While some have been very carefully revised (see, for example, chapters 4, 29 or 46), others have not. Consequently, some technologies are described as needing further research or development (e.g. ASR) and trends as being emerging instead of well-established (i.e. crowdsourcing), thus overlooking or not reporting on recent advancements. Considering the fast pace at which technology evolves in this field, this fact detracts from the quality of the publication. Having said that, the work involved in editing and reviewing an encyclopaedia of this magnitude can be endless, so ensuring that contents remain relevant throughout and are addressed appropriately as well as authored by renowned authorities are in themselves enormous challenges that the editor has overcome in a very successful manner. Overall, and despite the minor caveats mentioned in this review, this encyclopaedia is to be regarded as a key reference work for both students and scholars who would like to further their understanding of both general and specific aspects of translation technology.

REFERENCES

Austermühl, F. (2001). Electronic tools for translators. St Jerome.

Baños, R. (2018). Technology and Audiovisual Translation. In C. Sin-wai (Ed.), An Encyclopedia of Practical Translation and Interpreting (pp. 3–30). Chinese University Press.

Bolaños García-Escribano, A. (2025). Practices, education and technology in audiovisual translation. Routledge.

Bowker, L. (2002). Computer-aided translation technology: A practical introduction. University of Ottawa Press.

Díaz-Cintas, J. and Massidda. S. (2019). Technological advances in audiovisual translation (pp. 255-270). In M. O'Hagan (Ed.), The Routledge Handbook of Translation and Technology. Routledge.

Quah, C. K. (2006). Translation and technology. Palgrave Macmillan.

Rothwell, A., Moorkens, J., Fernández-Parra, M., Drugan, J., & Austermühl, F. (2023). Translation tools and technologies. Routledge.

Zapata, J., Secară, A., & Ciobanu, D. (2023). Past, present and future of speech technologies in translation — life beyond the keyboard. In J. Moorkens & V. Sosoni (Eds.), Proceedings of the 44th Translating and the Computer (TC44) Conference (pp. 16–25). Tradulex.

[ROCÍO BAÑOS]