Introduction

Hadley, James Luke; Taivalkoski-Shilov, Kristiina; Teixeira, Carlos S. C.; Toral, Antonio

Published in:
Using Technologies for Creative-Text Translation

DOI:
10.4324/9781003094159-1

Introduction

James Luke Hadley, Kristiina Taivalkoski-Shilov, Carlos S. C. Teixeira, and Antonio Toral

How to solve the problem of translation

The histories of Machine Translation and Translation Studies are fundamentally intertwined, and not only because both concern themselves with translation. They both developed as focused areas of study in the wake of the Second World War (Tymoczko 2006, 156). At this time, a new awareness of translation as a means by which speakers and writers of other languages can be made intelligible was being led by developments in communications, computational technologies, increasingly mechanised work practices, widespread literacy, and the availability of written materials. During the war, early computers had famously been employed by cryptographers in the race to decode enemy transmissions (Gambier 2018, 132–133). Fundamentally, these machines were codebreakers that could decipher the cyphers used to encode messages, such that the messages could be decoded in order to make them intelligible.

This approach has close parallels with Saussurean linguistic theories, which were preeminent at the time and which had shifted the study of linguistics away from etymology and language change to the analysis and description of linguistic structures, underpinned by the notions of the *signified* and the *signifier* (De Saussure 2011, 75). Under this paradigm, the lexical unit used to express something is seen as arbitrary, acknowledging that there is no intrinsic link between a word and the thing it represents (De Saussure 2011, 68). In turn, this notion tends to lead to the conclusion that signifiers or words are interchangeable, and, therefore, that one language can be used to indicate the same things as another language, even though the two may have no words in common.

Thus, if cryptographical machines could be used to replace one set of signs with another to encode or decode messages, it is reasonable to think that the signs could be replaced by words, and, therefore, languages could be treated as coding systems. Under this paradigm, translation is effectively the act of moving between coding systems such that the message is recoded but not fundamentally altered (see Lennon 2014, 137). Kenneth E. Harper (1955, 41), an American Russianist and early participant in experiments in what he calls "mechanical translation", reasons that

DOI: 10.4324/9781003094159-1

"since mathematics is itself a language—a set of symbols used to communicate thought—why can't computers be used to translate French into English, or Chinese into Portuguese?"

Some version of this understanding of translation, that texts in different languages could be "equivalent" to one another in terms of the messages they convey, underpinned much research in Translation Studies for the majority of the second half of the twentieth century. This research could be seen as a search for the solution to the equivalence problem, which made translation a messy, time-consuming, and laborious business.

The same understanding informed the early experiments in Machine Translation, which took place in the early years of the Cold War, when American intelligence hoped to develop an automatic tool for the deciphering of Russian materials, essentially seeing the Russian language as a code to be broken. Early experiments, though crude by today's standards, appeared to provide a proof of concept for the researchers, who created a system capable of translating over 60 Russian sentences into English and, on the basis of this, assumed that the problem of translation could be overcome in the foreseeable future:

> "Linguists will be able to study a language in the way that a physicist studies material in physics, with very few human prejudices and preconceptions … The technical literature of Germany, Russia, France, and the English-speaking countries will be made available to scientists of other countries as it emerges from the presses"
>
> (Macdonald 1954, 8)

The experiments and their promised results led to substantial state investment over the following years, though the speed of progress was not as meteoric as had been hoped. Despite early successes in translating simple sentences, training machines to decode messages in one language and then recode equivalent messages in another was more difficult than had been anticipated. Early systems attempted to imitate language teaching models that relied on rules and exceptions. Thus, grammatical structures were programmed into the systems along with those cases which did not conform to the same structures. The highly complex and labour-intensive nature of this work, coupled with the limitations on storage and processing power available in the mid-twentieth century, led to slow progress. This progress was assessed in 1966 by the Automatic Language Processing Advisory Committee (ALPAC), which determined in its report that the early confidence in Machine Translation's potential had been overestimated, asserting that "translations of adequate quality are not being provided" (National Research Council 1966, 16). As a result, it recommended that research funding be redirected into more fruitful endeavours. Such endeavours included finding "means for speeding up the human translation process," the "adaptation of existing mechanised editing and production processes in translation," and the "production

of adequate reference works for the translator, including the adaptation of glossaries that now exist primarily for automatic dictionary look-up in Machine Translation" (National Research Council 1966, 34). As a result, funding into Machine Translation-proper was reduced, with the funds channelled into what later came to be known as computer-aided translation.

Re-evaluating priorities

This move opened the door for the development of rudimentary computer-aided translation features, such as terminology databases, which store previously encountered terms in the source language and their user-defined translations in the target language. The same concept developed into translation memories, which are effectively corpora of previously encountered source language sentences, paired with their previously provided translations. These features developed from the 1990s on into a series of tools that could very well be argued to be indispensable to most professional translators of technical texts by the second decade of the twenty-first century.

Meanwhile, Machine Translation had also shifted its focus from rules and exceptions to parallel corpora, entering the Statistical Machine Translation paradigm by the late 1980s (Brown et al. 1988). Instead of relying on manually programmed rules and exceptions, Statistical Machine Translation relies on large bodies of parallel sentences representing both the source and target language. Systems built under this paradigm use statistical inference to determine the most likely parallel to the source text provided by referring to the parallel source-target corpus of sentences. The benefits of these systems are not limited to output quality but also include flexibility and the level of human intervention they imply. With rules-based systems, it is necessary to build one system per language pair, and the effort of programming all the rules and exceptions is very substantial. On the other hand, statistical systems rely on the corpora they are given, meaning that the work associated with building a system for a new language pair focuses on creating the parallel corpus rather than crafting the system itself.

Statistical Machine Translation systems improved translation quality, especially for language pairs such as English and French, which have similar grammatical structures and large enough amounts of data for the parallel corpora to be created. However, translation between languages with very different structures, or between languages with less human-translated material to base a corpus on, was still problematic.

During this time, Translation Studies too saw a shift of paradigms, from the focus on equivalence that had historically dominated research to a more nuanced examination of translations as sociocultural phenomena. The first steps in this direction had been made several years before, when Toury (1978) and others instigated the shift from prescribing best

practice in translation activity to describing observed translation activity. Functionalist approaches had come to see translations as texts that fulfil specific roles in their target contexts, as opposed to simply representing their sources, and the field shifted to assessing those roles and the strategies used by the texts to meet them (Snell-Hornby 2006, 51–56). As a result of two developments, the field shifted from attempts to make overarching theories of translation in the search for equivalence to more granular assessments of translation activities in context. Thus, the field expanded and diversified exponentially in response to the number of contexts in which translation activity is to be found, the case study became the dominant approach, and the theoretical basis around which Translation Studies had previously gravitated—the search for equivalence—lost most of its meaning.

Literature and other creative texts

Interest in literary translation as a distinct subdivision of Translation Studies could be said to have begun emerging around this time. However, it is important to note that literature had dominated theoretical and prescriptive discussions of Translation Studies since the earliest days of the field. And, to this date, it is not clear whether there is, or could be, a clear divide between literary and non-literary forms of translation. Even while Translation Studies diversified into fields ranging from non-professional translators to translation in crisis scenarios, from publishing practices to audiovisual translation, a substantial substratum of research remained squarely focused on the translation of literature in historical or contemporaneous contexts. A strong branch of research developed around the production of translation historiography, which very frequently focused on works of literature. For example, a whole series of works entitled The Reception of British and Irish Authors in Europe (www.bloomsbury.com/uk/series/the-reception-of-british-and-irish-authors-in-europe/) has been published by Bloomsbury since 2004, covering figures such as Jane Austen (Mandal and Southam 2007), Robert Burns (Pittock 2014), H.G Wells (Parrinder and Partington 2005), and Oscar Wilde (Evangelista 2010). While this series does include figures such as Charles Darwin (Glick 2014), the vast majority are individuals whose work was either fictional or poetic in nature.

As has already been noted, literature had a historically prominent place in theoretical studies on translation. However, while professional training in translation and interpreting existed since before the Second World War in some contexts (Gambier 2018, 133), systematic training specifically for the translation of literature and other creative texts was less widely available. However, the early years of the twenty-first century saw the development of an increasing awareness of the specific skills and training pertinent to the translation of texts of a primarily aesthetic, rather than primarily functional, nature. Thus, this period saw an

increasing number of specialist courses on the translation of literature and other creative texts emerge. Eventually, this growing awareness of what sets creative texts apart, and the training needs of translators specifically working on them, led to codification in the form of the PETRA-E Framework for Literary Translator Training. This framework is the first of its kind and was originally the product of a network of eight European partners with specialisms in literary translator training: BCLT (Norwich), CEATL (European network), Deutscher Übersetzerfonds (Berlin), ELTE (Budapest), FUSP (Misano), KU Leuven, Nederlandse Taalunie (The Hague), and Universiteit Utrecht, which, by 2022, has expanded to at least 25. It aims to "set up and strengthen the European infrastructure for the education and training of literary translators" (https://petra-education.eu/about-petra-e). As part of this aim, the framework was first produced in 2014, drawing together the research and pedagogical expertise of the network's partners. The framework sets out to catalogue, rather than prescribe, the skills and competencies pertinent to contemporary literary translators, subdividing these competencies into five levels: Beginner, Advanced Learner, Early Career Professional, Advanced Professional, and Expert (https://petra-educationframework.eu). Many of the skills listed inside this framework, including research and evaluative skills, overlap substantially with those expected of translators with many different specializations.

When the PETRA-E Framework was first developed, literature was still very much beyond the reach of Machine Translation systems, and this relative incompatibility was reflected by the framework's competencies, in which technology was only mentioned in relation to the ability to search the internet. However, this situation was soon to change, since, at much the same time, Machine Translation was experiencing another paradigm shift with the introduction of Neural Machine Translation systems (Bahdanau, Cho, and Bengio 2014). Like statistical systems, neural systems rely on corpora of existing parallel texts in both source and target languages. But the underlying mechanics of how these systems work differ in that statistical systems "chunk" sentences into smaller units which can be processed as they are. On the other hand, Neural Machine Translation systems process each sentence as a whole. But instead of representing the words as they are, the system represents them as numerical vectors, which can be used to calculate mathematical relationships, including the distances between words, leading to an improved level of fluency.

Thanks to this approach, Neural Machine Translation systems represent a substantial advance in output quality over statistical systems. However, they still suffer from similar limitations, including some which were previously unseen in Statistical Machine Translation systems. For instance, systems that are intended to work in specific domains of knowledge work best if the training data they are built on also draw from the same domains. It can also be that there is a payoff between generic

training data and domain-specific training data, meaning that more is not always better than less. The exception, however, is literature and other forms of creative text. Creative-text translation here refers to the translation of texts from one language to another where the texts themselves pivot broadly on the human creativity employed in their production. They rely more heavily on aesthetics for their existence than texts that aim to bring about an outcome directly, as in the case of technical texts. Thus, although literary texts—fictional works: novels, short stories, poems, plays, comics, and so forth—have historically occupied the central focus, the broader category of creative texts includes these and also:

- non-fictional texts, such as philosophical works, didactic books, and self-help books;
- performative works, such as songs, speeches, films, TV shows, and computer games; and
- promotional texts, such as commercials, advertisements, and propaganda.

While there appears to be a correlation between the quality of domain-specific technical translations produced using domain-specific training data, some, though not all, creative texts challenge this correlation by being highly internally variable. On one end of the literary spectrum are highly popular recent bestsellers with high readability scores brought about by their short, uncomplicated sentences and use of standard vocabulary. However, on the other end of the spectrum are works such as James Joyce's *Ulysses* (1922), which has comparatively low readability and generally very low BLEU Machine Translation quality scores (Toral and Way 2018).

One of the reasons that Neural Machine Translation systems tend to work better in the specific domains of knowledge on which they have been trained is because these knowledge domains tend to have formulaic constructions that become recognisable and reproducible when enough training data are introduced. On the other hand, creative texts are, to a large extent, defined by their idiosyncrasy, fitting into one and many national, cultural, temporal, and even personal styles. Neural Machine Translation systems generally require training data of many millions of words, organised as parallel sentences. Thus, training a system to translate legal statutes is fundamentally different from training a system to translate sonates, because while all the legal statutes included in the training data may follow a given tradition, the equivalent number of sonates will likely straddle multiple authors, periods, or traditions. Moreover, whereas, in a statute, each sentence can generally be taken as a distinct unit of meaning, enjambment means that, in a sonate, one line may or may not represent one unit of meaning and may also capitalise on this ambiguity to create further meaning. Thus, because a Machine Translation system needs to

break up a text into units before processing can begin, where such breaks should be introduced in the context of creative texts is not always clear.

Broadening the field

At the same time as the Translation Studies' shift from generalized equivalence-based arguments was allowing for greater consideration of context and a questioning of its historic Eurocentrism, the advance into Neural Machine Translation systems facilitated experimentation with new means of dealing with the issue of so-called low-resource languages, those languages that are generally not supranational and do not have large amounts of material that readily lends itself to the creation of parallel corpora. Previously, these languages could not readily be included in Machine Translation systems because there was insufficient data to achieve a meaningful result. However, Neural Machine Translation systems open new opportunities for such languages, including so-called transfer learning, in which a system is first trained using a high-resource language then a low-resource language that is related. For example, Spanish, a high-resource language, could be used as the basis for training a system to work with Catalan, a comparatively low-resource language that is closely related.

Another issue associated with translating creative texts is the comparatively high rate of referential consistency they exhibit (Voigt and Jurafsky 2012). Referential consistency describes meaning that ties individual sentences together, often introducing ambiguity if each sentence is considered in isolation. This issue, like other issues of ambiguity, is often not even noticed by human translators, who have a real-world understanding of the contents of the text that underpins their interpretation of it. However, the machine has no recourse to any such knowledge. Therefore, in examples such as "the cat tried to climb into the box but it was too small," a human intuitively grasps that "it" most likely refers to the box into which the cat attempted to climb. However, for the machine, whether "it" refers to the cat or the box most likely comes down to a statistical operation in the training data that is irrelevant to the specific sentence in question, effectively meaning that the choice informing the translated output is a guess. In a language like English, such a guess is unlikely to have a noticeable effect. However, if translated into a language such as French, Italian, Portuguese, or Spanish, where "cat" and "box" belong to different grammatical genders, the effects could be sizeable.

For these and many other reasons, literature specifically, and creative texts more broadly, have traditionally been viewed as fundamentally beyond the ken of Machine Translation systems as well as computer-assisted translation systems, which also function most efficiently in contexts with large amounts of repetition and large numbers of formulaic constructions. Among literary translation specialists, this sentiment has traditionally been expressed with a certain amount of hubris,

where computer-based systems in general are seen as a threat, but one which is kept at bay by the nature of the material. Conversely, Machine Translation specialists have tended to see literary translation as a high cost–low reward activity when compared to the translation of medical, legal, or other technical documentation.

However, traditional sentiments change, and, on both sides of the divide, a new generation of scholars has come to ask new kinds of questions over the past ten years (Voigt and Jurafsky 2012; Besacier and Schwartz 2015). In the world of literary translation, a generation of scholars who consider themselves digital natives has arrived who tend away from the subjective description that has often underpinned much case study research in Translation Studies towards empirical evidence. In Machine Translation, challenge-oriented scholars have come to describe literary translation as the last bastion of human translation (Toral and Way 2014, 174). Both camps are converging with their discreet skillsets on the textual, societal, economic, legal, and technological issues associated with translating creative texts with machines.

The year 2019 saw the first CALT (Computer-Assisted Literary Translation) workshop, which was followed by a workshop at the Machine Translation Summit on Literary Machine Translation and a panel at the EST Conference on Technology for creative-text translation. In 2020, the Goethe Institut created an online debate on AI and Literary Translation. In 2021, a full conference on CALT was instigated, there was a panel at the IATIS conference on creative texts, technology and ecology, and the PETRA-E conference devoted a whole day to issues surrounding literary Machine Translation and computer-aided literary translation. Over the same period, seminal publications making the first steps towards synthesizing a range of technological solutions with the translation of literary and other creative texts have been appearing, mostly in the form of the journal articles that are heavily cited throughout this book, but also, importantly, in monograph form. The year 2019 saw the appearance of Youdale's *Using Computers in the Translation of Literary Style: Challenges and Opportunities*, which combines Translation Studies' traditional translation and commentary approach with a range of electronic tools that can inform the human translator's work.

Thus, it is clear at this stage that interest in the subject is high and growing rapidly, not only among Machine Translation scholars keen to push the boundaries of what is technically possible but also Literary Translation specialists keen to assess the effects of the advancing technology on texts and readers. This synthesis is bringing about new ways of researching translation for both parties. For Machine Translation specialists, it is increasingly clear that seeing a human translation as the monolithic embodiment of the ideal, as has traditionally been the case, is an overly simplistic perspective on a highly variable process. More and more, it is becoming clear that for what and for whom a translation is produced are also important questions to ask when designing Machine

Translation systems. Equally, for literary translation specialists, it is clear that, without a quantifiable definition, nebulous but fundamental aspects of text production such as style are not easily analysed empirically, and subjective assessments of textual features can fall flat for an unsympathetic audience. However, retaining relevance in translation practice is a substantial challenge for Translation Studies as a whole, as it continues to grapple with the palpable divide with the industry, which has traditionally viewed "theory" as useless.

Crafting a snapshot

This book represents a snapshot of research into this emerging topic at this early stage. It is by no means representative of all the work currently underway on synthesizing technology with creative-text translation. However, it demonstrates not only how far the research has already come in a relatively short period but also what kinds of developments we may begin seeing soon. The chapters are arranged to flow from surveys on existing knowledge through new developments in tools for translating. A further examination of tools, this time in the context of analysing existing translations, follows. Finally, the book moves on to consider the legal and ethical implications of machines being more heavily integrated into human creative-text translation workflows.

In Chapter One, Ruffo sets out to assess the state of the relationship between technology and literary translators, asking about translators' perceived roles in society as well as their attitudes towards the use of technology in literary translation. She goes about this assessment by first establishing the basis on which literary translators build their own self-image and the input that literary translators have had in conversations on the technologiation of translation workflows to date. However, at the core of Ruffo's study lies a survey of 150 literary translation practitioners from 35 countries, designed to capture their positionality relating to the use of technology and correlate this with other aspects, such as their language pairs or level of experience. Building on Youdale's distinction between general and translation-specific technology, Ruffo's findings highlight an important point when considering technology in general as far as it relates to translation of whatever kind—that it is not clear where a line should be drawn between technological and non-technological interventions. While few would argue with the statement that Machine Translation is inherently technological, it is, perhaps, less immediately apparent, but no less true, that an online dictionary or archive, or indeed a word processing application, is also inherently technological in nature, as are paper dictionaries, even though the technology in question may not be digital.

In Chapter Two, Daems also makes use of a survey method, focusing on emerging technologies pertinent to literary translation workflows. Daems assesses the awareness and adoption of such technologies among 155

literary translators working into Dutch and establishes the factors that impact a translator's willingness to adopt new tools into their workflows. Her findings indicate that literary translators may be relatively slow to learn about emerging technologies, implying a kind of vicious cycle of technical translators being the heaviest users of such tools, and, therefore, the group to which such tools are primarily marketed. A minority of Daems' respondents appear to hold that technology is inappropriate for the translation of literary texts, implying that it might not be technology in general, but rather the technology that exists currently that is not ideally suited to literary translation. Daems further demonstrates that, despite the potential knowledge gap between the tools that exist and the literary translators who might make use of them, an overwhelming majority of the literary translators she surveyed have an interest in knowing more about technological developments pertinent to them. Thus, it may be that tools specifically aimed at literary translation, which are sensitive to the concerns expressed by literary translators, may be met with less resistance than may be assumed.

Turning to one of the functions that such creative-text translation-specific tools might focus on, in Chapter Three, Kolb and Miller assess the usefulness of PunCAT, a tool that assists in the translation of puns. Kolb and Miller focus on the English-German language pair on which the system was originally built by Miller (2019). They evaluate translations produced with and without the tool, the latter done by nine graduate students. Their findings demonstrate that tool use is not always straightforward, particularly in the context of translating. They find that, in some cases, users' reactions to the outputs provided by the tool are not as simple as reject or accept but are more nuanced than this, serving as ingredients for brainstorming, and ultimately assisting the translator in coming to an ideal solution. Importantly, Kolb and Miller also assess the translators' emotional reactions to the use of this tool, finding that, while many appreciated the tool as something that provides suggestions which can be ignored or built on, others found the use of the tool stressful and potentially constraining. These findings are very important both for the future development of the field and for tools that may be developed in the coming years. They show that managing expectations is as important as producing a tool that fulfils a given need. It is important that translators are made to feel that their agency is expanded, rather than constrained, by the tool. Or, to put it another way, that the tool provides one or more possible candidates, but these candidates aim to assist, rather than replace, the human translator's thinking.

In Chapter Four, we turn to the use of Machine Translation as a tool for advanced language learning. Oliver, Toral, and Guerberof Arenas discuss the use of a Neural Machine Translation engine in conjunction with the InLéctor collection of bilingual books for the creation of translated works of fiction that are not intended to be read in isolation but are aids for advanced language learners to decipher the work in the original

language. The underlying principle is that there is a balance to be struck between the speed of Neural Machine Translation and the quality of its outputs. If a language learner is sufficiently advanced to be able to read the work primarily in the original language and only requires reference to a translation as a means of support, the quality of the output may be sufficient to serve this purpose, and the speed by which the output can be produced may make its availability highly attractive. Oliver, Toral, and Guerberof Arenas' findings show that readers, especially those with a high level of proficiency in the target language, can benefit substantially from the presence of the machine-generated outputs. Specifically, the readers of the bilingual editions, as opposed to monolingual counterparts, found the reading experience easier and more enjoyable. At this stage, it remains to be seen whether these findings transfer into increased learning on the part of the readers or whether finding the answer instantly may hamper retention. Nonetheless, this experiment does stand in very good company with, for example, the Loeb Classical Library, which has been publishing works of classical literature with facing English gloss translations for pedagogical purposes for over 110 years (www.hup.harvard.edu/collection.php?cpk=1031). Moreover, the experiment highlights the importance of not seeing translation, whether machine or human, in monolithic terms but as a highly nuanced practice with different requirements depending on intended readership and use.

Naturally enough, comprehension works on multiple levels, particularly in the case of literary and other creative texts, which may make use of idioms and other devices that problematise understanding through gloss translation. In Chapter Five, Zajdel asks about the specific case of metaphor, comparing the translation of a work of literature into Spanish by a Machine Translation system with the same work translated by human translators. Zajdel subcategorises metaphors into four types, along with idiomatic expressions, and assesses the translation procedures used by a Machine Translation system on 50 of these metaphors found in a single work of literature. She then compares these procedures with their counterparts in two human translated versions of the same text. Zajdel's findings underscore the importance of not necessarily perceiving a human translation as the zenith of translation quality, as the procedures employed by the two human translators in question vary somewhat. Indeed, this variability is of note, since one of the biggest dividers between the human and machine translators in Zajdel's findings is the range of procedures employed by each when encountering metaphors. Whereas the Machine Translation system tends to translate each metaphor with a metaphor, the human translators exhibit a wider range of procedures, such as extrapolating metaphors or replacing them with alternative metaphors. Zajdel also finds, to some surprise, that idiomatic expressions tend not to be well translated by the machine in this case, despite such idiomatic expressions presumably finding their way into training data. This finding may be pertinent to future research on idioms and puns as far as training

data are concerned. One might conjecture that idiomatic expressions do not become statistically significant in training data until the point that they can be seen as cliché by human readers. Zajdel's work is important in dispelling any assumption that Machine Translation is simply incapable of working with metaphor or is restricted to working on the purely superficial level in this regard. Her results illustrate the creativity that can emanate from the use of Neural Machine Translation systems, which could easily prove to be a highly positive attribute as research in the field of literary Machine Translation develops.

In Chapter Six, Brusasco focuses centrally on this issue of creativity in Neural Machine Translation systems. She uses three Neural Machine Translation systems to translate the same extract of a literary text in order to assess the procedures that each undertakes and the extent to which creativity is manifest in each case. Brusasco's analysis assesses the quality of each translation, not only on the basis of creativity but also on the basis of acceptability in the target context. She also raises the important point that it can and possibly should be taken for granted at this stage that the outputs of Neural Machine Translation systems, particularly in the context of translating literary and other creative works, require human intervention in the form of post-editing. While some literary translators may see this shift as a profound one, where the human is demoted to controlling the quality of the machine's outputs rather than producing their own outputs directly, taken from another point of view, Neural Machine Translation systems as a whole could also be seen as computer-aided translation systems. In other words, since the human post-editor still retains decision-making agency and can choose to alter or overrule the machine's outputs, in just the same way as in Kolb and Miller's study, if human post-editing is taken for granted, the post-editor may rise in perceived importance. Brusasco speculates on the possible effects associated with training Machine Translation systems on works of literature, possibly by collecting texts belonging to single genres or even by single authors, and identifies certain potential issues with such a practice. She observes that such an approach could codify idiosyncrasies of style in Machine Translation outputs, which may have the effect of fossilising or stratifying high and popular literature, in a manner reminiscent of the current stratification between high- and low-resource languages.

Niskanen shifts our attention in Chapter Seven to the use that machines can have in supporting and augmenting the kinds of descriptive case study research that have become the norm in Translation Studies. His research focuses on intertextuality in four human translations of the same pastiche-laiden text, asking whether the extratextual cues present in the source text are reproduced in each of the translations. Niskanen's analysis is based theoretically and terminologically on Genette's (1997) work, codifying the *hypertext*, *hypotext*, and *paratext*. The tool he develops uses an electronic version of the text which contains tags that allow a user to gain further insights on intertextual references present within the text and to

assess their treatment in each of the translated versions. Niskanen's primary aim in this study is to explore the range of new research questions that such a system may make possible to Translation Studies researchers. He finds that, in the process of analysing these intertextual links, it can be observed that some human translators use the translation procedure of drawing on the target tradition as well as, or instead of, the source tradition. While Niskanen's work immediately opens up new ways for Translation Studies scholars to bring technology into traditional close reading analytical techniques, it also highlights the research element that lies at the heart of much literary and creative translation practice. It is easy to see that, armed with a tool that identifies and elucidates intertextual elements in a literary work, the element of chance that can underpin such work may be reduced. Translators using such tools may be able to work with a certain level of confidence that any intertextual links missed by the human translator will likely be found by the machine. Naturally enough, as seen in Kolb and Miller's work, the obverse may also be true, that such tools could lead especially emerging translators into a false sense of security that all intertextual links will be identified by the machine, or that the human translator is obliged to act on the links and only those that the machine has identified.

Bringing the book to a close are Koponen, Nyqvist, and Taivalkoski-Shilov in Chapter Eight, whose focus falls onto the legal, technical, and ethical issues of copyright and ownership in the context of creative and literary works translated in part or in whole by machines. Koponen, Nyqvist, and Taivalkoski-Shilov set out by assessing the situation of translation in general in the context of copyright, observing the uneasy relationship between a mode of text production that is inherently derivative and a system intended to control the creation of derivative work. Copyright further operates on the assumption that works have named and identifiable originators whose rights can be asserted in the event of derivations of those works being produced. Koponen, Nyqvist, and Taivalkoski-Shilov rightly point out that much computer-aided translation technology, as well as Machine Translation technology, relies on corpora of work produced by many individuals whose precise contribution may or may not be identifiable. Even in simple cases such as individual companies' Translation Memories, the production of the memories' contents is a collective process, and the assumption is that individual segments will be reused many times in the production of translations. Koponen, Nyqvist, and Taivalkoski-Shilov revisit the assumption that texts produced by Machine Translation systems currently require human intervention in the form of post-editing by pointing out that there are many cases where the copyright for a work has lapsed, leading to the production of new translations in which no such intervention has taken place. This issue, as Koponen, Nyqvist, and Taivalkoski-Shilov point out, is one of quality and reputation from the point of view of authors. They conclude by calling for a reassessment of copyright practices to reflect the

changing landscape of translation in general. Now that the use of technology has come to be integrated into many translation workflows, such legislation should continue to act as a protective measure for text producers in general and not only for those in positions of power.

The missing chapters

While it cannot claim to be comprehensive in encompassing all research into the use of machines in the translation of creative texts, this book does offer an overview of some of the key aspects of the emerging topic, which may become increasingly prominent over the coming years. In many ways, these topics are tied to the progress not only of technology but also of our understanding of the processes associated with translating creative works. Research abounds in Translation Studies on the interplay between ideology or philosophy and the translation process (e.g. Mason 1994; Leonardi 2007; Tymoczko 2006), the visibility or not of the translator in the final product (e.g. Venuti 2017), and the effects on target readers of the interpretations underpinning translations (e.g. Ece 2015; Vandaele 2002).

On the other hand, in Machine Translation, focus has historically fallen squarely on the question of how to produce translations of the highest possible quality. Now that Neural Machine Translation outputs, in the context of high-resource language pairs at least, have reached the stage of being directly comparable with human translations on more than the superficial or grammatical level (see Toral and Way 2018), it is possible to begin knitting these two areas of exploration together to ask how and whether decisions made in the creation of Machine Translation systems go on to have observable effects on the texts produced that fall beyond the scope of quality control.

At the same time, it becomes more meaningful than ever before to begin asking questions of a primarily stylistic nature about text-specific features, genre-defining conventions, and author-particular idiosyncrasies, and how and whether these are rendered by human and machine translators given the same task.

With such features in mind, it is no surprise that experiments are beginning in Machine Translation and computer-aided translation specifically in the context of highly stylised or formally constrained traditions of text production such as poetry and song. Questions are beginning to be asked about how such constraints can be harnessed in the production of Machine Translation outputs, and, concurrently, how machines can be used to facilitate the work of human translators working with such texts—for example, by identifying rhyme schemes and metrical patterns automatically. Similarly, advances in artificial intelligence mean that it may soon become possible to make computer-aided translation tools in general work not only more efficiently but also more intelligently. At the

same time, work on the experiences of users working with these systems may see changes to interfaces that could assist in familiarising technology to translators who have been historically resistant to it or found it less than useful. In the coming years, it is likely that the pace of research in these and many other aspects will increase, leading to ever more flexibility in translating under formally constrained conditions and other situations relevant specifically to creative texts.

Another topic that is not directly handled in this book and is likely to attract attention over the coming years is that of voice dictation. As speech recognition software improves in quality, particularly for high-resource languages, it has been integrated with Machine Translation systems, giving a rudimentary workaround for the interpreting of the spoken word. Interpreting is seen by many as a sister skill to translation, with many of the same concerns as well as additional practical constraints, the most obvious of which is possibly the ephemeral nature of the spoken word. Machine Translation systems and CAT tools, on the other hand, have historically only processed written text, meaning that oral speech has needed to be transcribed before it could be translated. In the context of creative texts with oral and other performative components, such as speeches, plays, and many forms of poetry, conceptualizing the material purely in textual form tends to overlook the performative aspect and the textual fluidity that this creates. It is not currently clear how or whether current Machine Translation or CAT tool systems could be adapted to material that is not in a written form. There are fundamental differences between written text and spoken speech that go beyond their two media of communication.

Work on copyright and other legal aspects associated with the production of translations, of the kind seen in Koponen, Nyqvist, and Taivalkoski-Shilov here, is also likely to become increasingly important over the coming years and as the number of works of literature produced primarily or partly by machines rises. The substantial variation in copyright law in various jurisdictions around the world, coupled with dramatically different translation and publication norms and expectations globally, will likely mean that issues pertaining to the legal interplay between human and machine in the production of intellectual property is likely to become substantially more complex as the technology advances.

Thus, the primary objective of this book is to capture the state of the art of the use of machines in the translation of creative texts at the first stage of its development, when discussing the field in solid, rather than abstract, terms has become meaningful. The book works in full awareness that, in such a rapidly developing field, the gap between the cutting edge and obsolescence is short. However, the thematic range of the research represented by its chapters also goes some way to showcasing the vast opportunities and challenges that are only now being made apparent to us as we take the first steps into this new landscape of research.

References

Bahdanau, Dzmitry, Kyunghyun Cho, and Yoshua Bengio. 2014. "Neural Machine Translation by Jointly Learning to Align and Translate." arXiv preprint:1409.0473.

Besacier, Laurent, and Lane Schwartz. 2015. "Automated Translation of a Literary Work: A Pilot Study." In *Proceedings of the Fourth Workshop on Computational Linguistics for Literature*, 114–122. Denver, CO.

Brown, Peter F., John Cocke, Stephen A. Della Pietra, Vincent J. Della Pietra, Frederick Jelinek, Robert L. Mercer, and Paul S. Roossin. 1988. "A Statistical Approach to Language Translation." In *Proceedings, 12th International Conference on Computational Linguistics (COLING-88)*. Budapest, Hungary, August 1988, 71–76.

De Saussure, Ferdinand. [1959] 2011. *Course in General Linguistics*. Translated by Wade Baskin. Columbia University Press, New York.

Ece, Ayşe. 2015. "The Trajectory of Literary Translation: From Interpretation to (Re) Writing and a New Life." *Synergies Turquie*, 8.

Evangelista, Stefano, ed. 2010. *The Reception of Oscar Wilde in Europe*. Bloomsbury Publishing, London and New York.

Gambier, Yves. 2018. "Institutionalization of Translation Studies." In *A History of Modern Translation Knowledge*, edited by Lieven d'Hulst and Yves Gambier, 131–142.

Genette, Gérard. [1987] 1997. *Palimpsests: Literature in the Second Degree*. Translated by Channa Newman and Claude Doubinsky. Lincoln: University of Nebraska Press.

Glick, Thomas F., and Elinor Shaffer, eds. 2014. *The Literary and Cultural Reception of Charles Darwin in Europe*. Vol. 17. Bloomsbury Publishing, London and New York.

Harper, Kenneth E. 1955. "Translating Russian by Machine." *Journal of Communication* 5 (2): 41–46.

Joyce, James. 1922. *Ulysses*. Paris: Shakespeare.

Lennon, Brian. 2014. "Machine Translation: A Tale of Two Cultures." In *A Companion to Translation Studies*, edited by Sandra Bermann and Catherine Porter, 136–146. Oxford: Wiley.

Leonardi, Vanessa. 2007. *Gender and Ideology in Translation: Do Women and Men Translate Differently? A Contrastive Analysis from Italian into English*. Bern: Peter Lang.

Macdonald, Neil. 1954. "Language Translation by Machine: A Report of the First Successful Trial." *Computers and Automation* 3 (2): 6–10.

Mandal, Anthony, and Brian Southam, eds. 2007. *The Reception of Jane Austen in Europe*. Vol. 13. A&C Black, London and New York.

Mason, Ian. 1994. "Discourse, Ideology and Translation." In *Language, Discourse and Translation in the West and Middle East*, edited by Robert de Beaugrande, Abdullah Shunnaq and Mohamed H. Heliel, 23–34. Amsterdam: John Benjamins.

Miller, Tristan. 2019. "The Punster's Amanuensis: The Proper Place of Humans and Machines in the Translation of Wordplay." In *Proceedings of the Human-Informed Translation and Interpreting Technology Workshop* (HiT-IT 2019), 57–65.

National Research Council. 1966. *Language and Machines: Computers in Translation and Linguistics (ALPAC)*. Washington, DC: The National Academies Press. https://doi.org/10.17226/9547.

Parrinder, Patrick, and John S. Partington, eds. 2005. *The Reception of HG Wells in Europe*. Bloomsbury Publishing, London and New York.

Pittock, Murray, ed. 2014. *The Reception of Robert Burns in Europe*. Bloomsbury Publishing, London and New York.

Snell-Hornby, Mary. 2006. *The Turns of Translation Studies: New Paradigms or Shifting Viewpoints?* Amsterdam: John Benjamins.

Toral, Antonio, and Andy Way. 2014. "Is Machine Translation Ready for Literature?" *Proceedings of Translating and the Computer* 36: 174–176.

Toral, Antonio, and Andy Way. 2018. "What Level of Quality Can Neural Machine Translation Attain on Literary Text?" In *Translation Quality Assessment*, edited by Joss Moorkens, Sheila Castilho, Federico Gaspari and Stephen Doherty, 263–287. Springer, Cham.

Toury, Gideon. 1978. "The Nature and Role of Norms in Literary Translation." In *Literature and Translation: New Perspectives in Literary Studies*, edited by James S. Holmes, José Lambert and Raymond van den Broeck, 83–100.

Tymoczko, Maria. 2006. "Translation: Ethics, Ideology, Action." *The Massachusetts Review* 47 (3): 442–461.

Vandaele, Jeroen. 2002. "Introduction: (Re-) Constructing Humour: Meanings and Means." *The Translator* 8 (2): 149–172.

Venuti, Lawrence. 2017. *The Translator's Invisibility: A History of Translation*. Routledge, London and New York.

Voigt, Rob, and Dan Jurafsky. 2012. "Towards a Literary Machine Translation: The Role of Referential Cohesion." In *Proceedings of the NAACL-HLT 2012 Workshop on Computational Linguistics for Literature*, 18–25.

Youdale, Roy. 2019. *Using Computers in the Translation of Literary Style: Challenges and Opportunities*. Routledge, London and New York.