

## **MACHINE TRANSLATION AND COMPUTATIONAL LINGUISTICS**

Making computers translate has been the dream and goal of computer scientists since the early days of computing. The idea of machine translation was born before word processing, spreadsheets and electronic data transfer and long before DTP (Desktop Publishing) and the Internet.

To process any translation, human or automated, the meaning of a text in the source language must be fully restored in the target language. While on the surface this seems straightforward, it is far more complex. Translation is not a mere word-for-word substitution. A translator must interpret and analyze all of the elements in the text and know how each word may influence another. This requires extensive expertise in grammar, syntax and semantics in the source and target languages, as well as familiarity with each local region.

Machine translation (MT) is a process whereby a computer program analyzes a source text and, in principle, produces a target text without human intervention. In reality, however, machine translation typically does involve human intervention, in the form of pre-editing and post-editing. Anyway, in view of the frequent inaccuracy of machine translation, human translation remains the most reliable and accurate form of translation available.<sup>1</sup>

So, what is a machine translation? Machine translation, sometimes referred to by the abbreviation MT (not to be confused with computer-aided translation (CAT), machine-aided human translation (MAHT) or interactive translation) is a sub-field of computational linguistics that investigates the use of software to translate text or speech from one natural language to another.

On a basic level, MT performs simple substitution of words in one natural language for words in another, but that alone usually cannot produce a good translation of a text, because recognition of whole phrases and their closest counterparts in the target language is needed. Solving this problem with corpus and statistical techniques is a rapidly growing field that is leading to better translations, handling differences in linguistic typology, translation of idioms, and the isolation of anomalies.

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<sup>1</sup> Church, K. W., Hovy, E., Good Applications for Crummy Machine Translation, Berkeley, CA., University of California, 1991

The progress and potential of machine translation has been debated much through its history.

Since the 1950s, a number of scholars have questioned the possibility of achieving fully automatic machine translation of high quality.

When there is a need to translate a document coming across an ambiguous word, the first thing that comes to your mind is to open "google translate" and ditch the word to know its meaning. Then, you feel relieved as you kill your curiosity towards such an ambiguity that would affect your whole work. However, sometimes this translation seems to be too shallow as the selection of words is poor due to the rough use of machine translation. Another disadvantage is that MT cannot be used in literary translations. The reason they claim is because it lacks the capacity to do so. Thus, MT is regarded in only quick translation of words not texts. Some translators stand against MT as they think that it takes their jobs. They claim that the quality of translation that is currently possible with MT is one reason why it is wrong to think of MT systems as dehumanizing monsters which will eliminate human translators, or enslave them.

When MT is used to translate a text, the user gambles with the text and its contents. MT does not concentrate on the context. Instead, it focuses on the tasks to be done with them in a matter of no time comparing with human translation. However, the meaning, in this way, is not fully the main goal. Translating literature requires special literary skill - it is not the kind of thing that average professional translator normally attempts. So, accepting the criticism does not show that automatic translation of non-literary texts is impossible. Literary translation is a small proportion of the translation that has to be done, so accepting criticism does not mean that MT is useless. Finally, one may wonder who would ever want to translate Shakespeare by machine - it is a job that human translators find challenging and rewarding, and it is not a job that MT systems have been designed for. The criticism that MT systems cannot translate Shakespeare is a bit like criticism of industrial robots for not being able to dance "Swan Lake".<sup>1</sup>

To add more advantages, MT saves time and efforts in looking up in dozens of references; it is faster, more cost effective and more accurate than its human counterpart. Moreover, the best quality in MT is Confidentiality as when it is used in Private email services, no one would like to give his confidential letters to translators to have a look at and then render them.

To sum up, MT is one of the most practical technologies that Human ever used. It widens the horizons of languages and fills in the culture gaps through

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<sup>1</sup> Newton J., *Computers in Translation: A Practical Appraisal*, London, Routledge, 1992

instant assistance. The only requirement from a human being is to be able to use it professionally or at least logically by filtering the context and selecting the best word choice that suits the actuality of the text. As any other gadget that human uses, MT can be of benefit if it is used wisely in business worldwide and in intercultural medium as well.

A further application of MT is also that of web-searches and translation of web pages. As the internet is flooded with new users from various backgrounds and cultures, linguistic demands are also increasing and languages become barriers to communication. As a consequence, many search engines (Google, AltaVista, Yahoo and others) provide machine translation services to improve (if not eliminate) this problem.

Machine translation systems and output can be evaluated along numerous dimensions. The intended use of the translation, characteristics of the MT software, the nature of the translation process, etc., all affect how one evaluates MT systems and their output. There are various means for evaluating the output quality of machine translation systems. The oldest is the use of human judges to assess a translation's quality. Even though human evaluation is time-consuming, it is still the most reliable way to compare different systems such as rule-based and statistical systems. Relying exclusively on unedited machine translation ignores the fact that communication in human language is context-embedded and that it takes a person to comprehend the context of the original text with a reasonable degree of probability. It is certainly true that even purely human-generated translations are prone to error. Therefore, to ensure that a machine-generated translation will be useful to a human being and that publishable-quality translation is achieved, such translations must be reviewed and edited by a human. The late Claude Piron<sup>1</sup> wrote that machine translation, at its best, automates the easier part of a translator's job; the harder and more time-consuming part usually involves doing extensive research to resolve ambiguities in the source text, which the grammatical and lexical exigencies of the target language require to be resolved.

Despite of those disadvantages above, machine translation still maintains some advantages. First, machine translation is much faster than human translation. Second, machine translation has a much huger quantity of vocabulary than human. Although post-editing is still needed by translators, they only need to adjust some words or grammar according to the ready-made target texts from machine translation. This will greatly improve the speed and efficiency of translators.

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<sup>1</sup> <http://claudepiron.free.fr/articlesenanglais/effects.htm>

As a result, it is undoubtedly that human translation should integrate with machine translation to make up for each other's deficiencies.

Any attempt to replace Human Translation totally by machine translation would certainly face failure for, due to a simple reason, there is no machine translation that is capable of interpretation. For instance, it is only the human translator who is able of interpreting certain cultural components that may exist in the source text and that cannot be translated in terms of equivalent terms, just like what automatic translation does, into the language of the target text.

In addition, it is widely agreed upon that one of the most difficult tasks in the act of translation is how to keep the same effect left by the source text in the target text. The automatic translation, in this regard, has proved its weakness, most of the time, when compared with a human translation.

It is an undeniable fact that automatic translation is regarded as a tool for producing quick and great number of translated texts; nevertheless, the quality of the translation is still much debatable. And, of course, editing a machine translation is far more gratifying than editing the work of a human! Really! One often sees the same stupid mistakes (though mistakes by the computer tend to be more consistent, thus easier to correct), but human translators get upset and still insist on getting paid for their shoddy work. A machine has far less ego, and takes such correction in stride. Some in fact, such as Google Translate, will take your feedback and try to do better in the future. Now, how many translators can you say that of?

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2. Crystal D., *The Cambridge Encyclopedia of Language*, Cambridge University Press, 1987
3. Church, K.W., Hovy, E., *Good Applications for Crummy Machine Translation*, Berkeley, CA., University of California, 1991
4. Newton J., *Computers in Translation: A Practical Appraisal*, London, Routledge, 1992
5. Vasconcellos M., Bostad D.A., *Machine Translation*, New York, Routledge, 1992
6. [http://en.wikipedia.org/wiki/Machine\\_translation](http://en.wikipedia.org/wiki/Machine_translation)
7. <http://claudepiron.free.fr/articlesenanglais/effects.htm>