A critique of contemporary translation technology

The Threelford Lecture 2016
Chartered Institute of Linguists
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Dublin City University
Translators are generally well disposed to technology.

(Koskinen and Ruokonen 2017)
(LeBlanc 2013, 2017)
Outline

• Translation technologies (in three words)
• Impact on translation and translators
• The bigger picture
Translation Strategies

REDUCE
say less
translate less
### Getting Started

**Finding a location for your photo printer**

Place the photo printer on a flat, clean and dust-free surface, in a dry location and out of direct sunlight.

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### Guide de démarrage

**Emplacement de votre imprimante photo**

Placez l'imprimante photo sur une surface plane et propre, dans un lieu sec et à l'abri de la lumière directe du soleil.
Translation Memory Tools
Statistical Machine Translation

Translations stored in translation memories can be reused.

They can also be recycled...
Example SMT Systems

Google translate

KantanMT.com

Microsoft Translator

omniscien technologies

MT@ec
SMT Architecture

**Training**
- STs + Human Translations
- Texts in the Target Language

**Translation Model**

**Language Model**

**Decoding**
- Decoder
- ‘Best’ Translation
- New SL texts to translate
So what gets recycled?

- Phrase translations for *den Vorschlag* learned from the Europarl corpus:

| English              | $\phi(\tilde{e}|f)$ | English              | $\phi(\tilde{e}|f)$ |
|----------------------|----------------------|----------------------|----------------------|
| the proposal         | 0.6227               | the suggestions      | 0.0114               |
| ’s proposal          | 0.1068               | the proposed         | 0.0114               |
| a proposal           | 0.0341               | the motion           | 0.0091               |
| the idea             | 0.0250               | the idea of          | 0.0091               |
| this proposal        | 0.0227               | the proposal ,       | 0.0068               |
| proposal             | 0.0205               | its proposal         | 0.0068               |
| of the proposal      | 0.0159               | it                   | 0.0068               |
| the proposals        | 0.0159               | ...                  | ...                  |

Source: Philipp Koehn
# Statistical Machine Translation

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<tbody>
<tr>
<td>Early experiments at IBM</td>
<td>IWSLT shared task evaluations start</td>
<td>WMT shared task evaluations start</td>
<td>Google Translate moves fully to SMT</td>
<td>SMT is state of the art, out-performing all other approaches to MT</td>
<td>Neural MT outperforms SMT in shared tasks</td>
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Neural Machine Translation

NMT is appealing since it is conceptually simple. NMT is essentially a big recurrent neural network that can be trained end-to-end and translates as follows. It reads through the given source words one by one until the end, and then, starts emitting one target word at a time until a special end-of-sentence symbol is produced.

Luong and Manning 2015
La croissance économique a ralenti ces dernières années.

Economic growth has slowed down in recent years.
Neural Machine Translation

From the architectural point of view, a large recurrent network trained for end-to-end translation is considerably simpler than traditional MT systems that integrate multiple components and processing steps. On the other side, the NMT process is less transparent than previous paradigms. Indeed, it represents a further step in the evolution from rule-based approaches that explicitly manipulate knowledge, to the statistical/data-driven framework, still comprehensible in its inner workings, to a sub-symbolic framework in which the translation process is totally opaque to the analysis.

Bentivogli et al. 2016
Back to SMT...
The Chancellor or the Chancellor has a prominent position in the government.
University without Language Barriers

Introducing the First Simultaneous Translation Service by Computer

Simultaneous Speech Translation

www.eu-bridge.eu/lecture.html
InterACT

- International Center for Advanced Communication Technologies (InterACT)
- Exzellenznetzwerk: 8 Top-Universitäten
  - Gegründet 2004
  - Direktor: Alex Waibel
- Ziel des Zentrums:
  - Ausbildung: Internationalisierung für Studierende, Mitarbeiter, Forschungsgruppen
  - Forschung: Zukunftweisende Kommunikationstechnologien

Zunächst mal möchte ich mich selber kurz vorstellen, wie mein Name ist Alex Waibel. Ich bin der Leiter.

Afterwards also to participate in this panel discussion will be. First of all, I would like to introduce itself briefly as my name is Alex Waibel. I am the conductor.
Skype Translator

www.skype.com/en/features/skype-translator
Responses from Translation Studies?

It is usually enough for translators who want to use [Google Translate] for initial drafting to know *nothing at all* about SMT.

Statistical-based MT, along with its many hybrids, is destined to turn most translators into posteditors one day, perhaps soon.

The question, in the long term, will not be *whether* translation will be done from the MT baseline, but simply *when* (and for which types of text and into which languages).
The inevitability of post-editing?
Share of the translation services market accounted for by PEMT

Source: Common Sense Advisory 2014
‘The contribution of PEMT to the overall market has been slowly creeping up over the last few years, but it is still relatively small …’

Common Sense Advisory 2014

CSA 2012: 38.63% of LSPs offered PEMT
Almaghout et al. 2012: 42%; Doherty et al. 2013: 34%
And for which ... and into which languages?

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<th>Source Language</th>
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Table 2: BLEU scores for the 110 translation systems trained on the Europarl corpus

Source: Koehn 2005
And why just post-editing?
Possible Interventions to Improve MT Output

- STs + Human Translations
- Texts in the Target Language
- Language Model Tuning
- Translation Model Tuning
- More/better data
- Add glossaries
- Improve outputs e.g. POST-EDIT
- ‘Best’ Translation
- Pre-edit
- Evaluate outputs
- New SL texts to translate
- Decoding
- Training
Issues in Post-Editing

• Environments
• Productivity
• Cognitive effort
• Enjoyment
• Payment
Post-Editing Effort?

raw MT editing effort may be equivalent to that required for 80%-90% fuzzy matches in translation memory

O’Brien 2006, Guerberof 2008
Post-Editing Enjoyment?

an edit-intensive, mechanical task that requires correction of basic linguistic errors over and over again

Moorkens and O’Brien 2017

it’s mechanics, and if it’s mechanic, there must be a way it could be done by a machine

Informant F in Moorkens and O’Brien 2017
Payment

Percentage of normal translation rate at least 75% of translators were willing to accept to take on post-editing jobs

Alessandro Cattelan’s (Translated.net) purchase order acceptance rate experiment 2012
https://www.matecat.com/publications/a-fair-rate-for-post-editing/
Productivity

Productivity can be expressed in terms of two key performance indicators:

- Time to edit: the average number of words processed by the translator in a given time span
- Post-editing effort: the average percentage of word changes applied by the translator on the matches provided

Cattelan ibid.
What Post-Editors Want

- ways of eliminating repetitive tasks
- confidence scores
  - system tells the user how good or bad it thinks the SMT output it
- provenance data
  - where does the proposal from the TM/SMT system come from?
- status data
  - is the proposal already approved? Pending approval? etc.
New generation TM/MT tools

- Feed of SMT directly to editor where there is no useful translation already in translation memory
- Feature whereby translators can create their own SMT systems based on their own proprietary data
- Intelligent auto-completion
- Real-time retraining of background SMT systems
- Quality estimation (confidence scores)
- Provenance data
- Productivity information
- User Activity Logging
Confidence Measures

Lisboa y Madrid desee embarcarse en un camino diferente del adoptado por Grecia e Irlanda.

The goal of confidence measures highlighting is twofold. First, it helps the user to spot wrong translations (words with very low confidence are rendered in red). Second, it can also inform the user about the dubious translations (rendered in orange).
Translation Technology in Translation Studies

Focus has been on description of tools, their functions and design, and ‘how to’ guides written for pedagogical/training purposes.

Far less emphasis on the “deeper implications of these technologies set within a wider spectrum of cultural (i.e. ethical, political, social) concerns”

(Folaron 2013: 6)

Not to mention economic and legal concerns...
Professional ethics and SMT

In the case of Free Online MT

– breach of contract
– confidentiality (despite ‘anonymisation’)
– permission to use others’ work
– attribution

(Drugan and Babych 2010)
Translators constantly concerned about having to work to lower quality standards, to produce just ‘good enough’ (post-edited) translation (see Drugan 2013)
Translation ethics (Chesterman 2001)

Typical foci:
• representation of STs, authors, the Other
• service, communication, norms

What about the world’s responsibility towards translators and interpreters? This would belong to ‘a general ethics of translation and translatorial behaviour’.
Translation ethics

**virtue**: ‘an acquired human quality that helps a person strive for excellence in a practice’

in order to make the best ethical decisions, the most important virtue that a translator can possess is the desire to make the right decision:

‘the translator must *want* to be a *good* translator, must strive for excellence in the practice of translation’

(Chesterman 2001)
How can you strive to be your best at being just ‘good enough’?

The post-editor’s dilemma?
The Ethics of Representation: Translation as a natural resource

‘[Microsoft’s] largest available natural resource is the nearly two decades of product documentation that has been localized into an increasing range of languages and preserved as translation memories.’

Joscelyne (2009: 7)
Natural Resource Metaphor

~45 instances of discovery of/discover*+dir obj

N Concordance
17 exists. However, this was not sufficiently balanced by a conservative discovery of correspondences in the pair extraction algorithm. Although the
18 subset of the phrase pairs in the Baseline+Syntax model.10 This discovery is a very positive and interesting by-product of these experiments.
19 cognates (Sect. 4.1) and an algorithm for applying the induced rules to the discovery of potential cognates in a corpus (Sect. 4.2). 4.1 Learning
20 and used to group together related data. This approach supports the discovery of knowledge from the acquired data (i.e. from the ground) instead
21 Till now, the focus of most of the investigations in this field has been on the discovery and pairing of bilingual sites, domains, HTML documents and
22 available texts, we propose and investigate a general framework for the discovery of such expressions from comparable corpora. The main practical
23 not received much attention, possibly because in many applications the discovery of translationally equivalent vocabulary items was the main goal
24 to search for their translations in the French sentences. This makes the discovery of the different translation possibilities more difficult (adaptées à,
25 text needs to be produced by translators before it can be used for the discovery of new dictionary entries. Bilingual comparable corpora are an

Kenny (in preparation)
9 instances of **MINE** in the *Machine Translation* Corpus, e.g.:

N Concordance

1. parallel alignment approaches. We are interested in (1) how to **mine** web content and prepare HTML files for bilingual text alignment of bilingual corpus building. What we need is to seek ways to **mine** the widely available web resources to bridge the gap in the accessing server-resident databases. Translators can still **mine** their own databases, and expand them with the translation units previously have been shown to profit from translation equivalents **mined** from comparable corpora, including construction of probabilistic translation extraction of web-based materials is mostly related to **mining** web contents as a bilingual corpus and aligning the bilingual on data source acquisition for natural language processing tasks by **mining** the world wide web. Representative works related to the

655 instances of **EXTRACT** in the *Machine Translation* Corpus, e.g.:

N Concordance

1. texts. These are also the two primary challenges facing systems that **extract** translations from bilingual websites. As we know, the building order are going to be preferable to orderings which are very different. We first **extract** permutations from alignments, and then apply standard distance parser with deterministic head-finding, while Owczarzak et al. (2007a) **extract** the semantic dependency relations from an LFG parser (Cahill et al. 2012) to lemmas and suffixes. 4. Apply morphological transformation rules. 5. **Extract** the surface string. For syntactic transformation, we propose a original is aligned with its translation at the sentence level) can be used to **extract** new dictionary entries with high accuracy (Dagan and Church 1997; Gavalda and Church 2002) **extract** translation rules through one-time traversal of the leaf nodes in make use of new tools to automatically build a large parallel treebank and **extract** a set of linguistically-motivated phrase pairs from it. We show news releases in the StatCan publication The Daily. The goal is to **extract** translations for translation memory systems, for translation **Abstract** Statistical methods to **extract** translational equivalents from non-parallel corpora hold the promise

Kenny (in preparation)
If we move straight to ‘translating from MT’, what other previous, hard-earned accomplishment might be put in jeopardy?

(Garcia 2010, 2011)
(Hirshmann 1991; Morozov 2013)
Ethics and New Translation Tools

Surveillance?
Higher risk of ‘data dispossession’?
Economics

“We’ve decided not to pay most people for performing the new roles that are valuable in relation to the latest technologies. Ordinary people ‘share’, while elite network presences generate unprecedented fortunes.”

“in the long term, this way of using network technology is not even good for the richest and most powerful players, because their ultimate source of wealth can only be a growing economy. Pretending that data come from the heavens instead of from people can’t help but eventually shrink the overall economy.”

(Lanier 2013: 11,12)
Source documents to be translated will generally be protected under copyright in the European Union. Similarly, short segments (bits and pieces of such source documents and translations) may also be protected by copyright. The length of a work is not per se a pertinent criterion to assess originality.
Social Issues: Shifting Identities

- ‘cross-language carriers’ \cite{joscelyne2008}
- ‘post-editor’ used to describe person editing matches from translation memory, as well as translations from an MT engine \cite{guerberof2008}
- ‘monolingual translator’ used to describe post-editor with no knowledge of the SL \cite{koehn2010; koehn2013}
- ‘translating by post-editing’ \cite{garcia2011}
Boundary Shifters

The actors in my study also morph their identities. Musicians on occasion turn into salesmen; engineers on occasion turn into musicians; and engineers can become salesmen...When the modular Moog synthesizer was first used in recording studios, no one knew what to call its operators: were they engineers, programmers, producers, musicians, or what?...I call these actors “boundary shifters.’

Pinch (2008)
Moving towards a conclusion

Technoneutrals

“on the one hand this, but on the other hand that”

(Tehrani 1990; Morozov 2013)
Science and Technology Studies

The impact of a technology:

• is always mediated through institutions and social forces
• does not flow from the inherent characteristics of the technology
• is not neutral
• depends on the context
And finally:

The time is ripe for even more research into translation technology that comes from within the humanities and social sciences.

We need more sociologically-oriented, ethically-aware, critical research in translation technology.
Thank you!
References


Evgeny Morozov. 2013 To Save Everything, Click Here. London: Allen Lane.

Sharon O’Brien. 2006. Pauses as indicators of cognitive effort in post-editing machine. Across Languages And Cultures, 7, 1, 1-21, DOI:http://dx.doi.org/10.1556/Acr.7.2006.1.1


