Machine Translation Summit XVII



Second MEMENTO workshop on Modelling Parameters of Cognitive Effort in Translation Production

> 20 August, 2019 Dublin, Ireland

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Preface from the co-chairs of the workshop

Over the last three decades empirical Translation Process Research (TPR) has been prolific in the generation of hypothesis and models, which were based mostly on insights drawn from from-scratch translation. More recently, TPR has also addressed - among other things - post-editing and spoken translation (sight translation, interpretation), and tried to come up with more comprehensive cognitive models of the translation process which are based on empirical data and include various dichotomies, such as comprehension/production, speaking/writing, manual/computer assisted translation, etc. In order to address those newly emerging research questions, the MEMENTO project boosts empirical TPR by organizing yearly international 'bootcamps' to elaborate and investigate TPR-related research hypotheses over a three to fourweek period and by disseminating the results of those bootcamps in successive conferences and workshops. The first MEMENTO bootcamp took place in July 2018 at the University of Macau, and a successive first MEMENTO workshop was conducted in November 2018 in Beijing in the context of the 5th International Conference on Cognitive Research on Translation and Interpreting. The second MEMENTO bootcamp took place in July / August 2019 at Kent State University/USA. Approximately 20 early and more matured researchers discussed, developed, and proto-typed methods and solutions to address and evaluate TPR-related hypothesis over a four-week period. The Second MEMENTO workshop – conducted in the context of the MT-Summit 2019 in Dublin - is a forum to present and discuss some of the outcomes of this four-weeks bootcamp in a public space, and to gather feedback and input for the continuation of the ME-MENTO project(s) in the future. It therefore contains several contributions from participants of the first and the second MEMENTO bootcamp, but also a small number of abstracts from presenters who did not attend the MEMENTO bootcamps (yet). We collected 12 abstracts covering a range of TPR-related topics, including aspects of cognitive load in written and spoken translation, addressing issues in translation difficulty and translation quality assessment, translations of metaphors and neologisms, as well as audio-visual translation and lexical representation. We hope to have compiled a collection of abstracts that covers many of the topics for Modelling Parameters of Cognitive Effort in Translation Production.

We look forward to welcoming you at the Second MEMENTO workshop 2019 in Dublin.

Michael Carl and Silvia Hansen-Schirra

Organizers

Workshop Chairs

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Program Committee

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Contents

Edit distances do not describe editing, but they can be useful for translation process research Félix do Carmo	1
Modelling word translation entropy and syntactic equivalence with machine learning Bram Vanroy, Orphée De Clercq, Lieve Macken	3
Comparison of temporal, technical and cognitive dimension measurements for post-editing effort Cristina Cumbreno, Nora Aranberri	5
Translation Quality and Effort Prediction in Professional Machine Translation Post-Editing Jennifer Vardaro, Moritz Schaeffer, Silvia Hansen-Schirra	7
With or without post-editing processes? Evidence for a gap in machine trans- lation evaluation Caroline Rossi, Emmanuelle Esperança-Rodier	9
Investigating Correlations Between Human Translation and MT Output Samar A. Almazroei, Haruka Ogawa, Devin Gilbert	11
Lexical Representation & Retrieval on Monolingual Interpretative text produc- tion Debasish Sahoo, Michael Carl	14
Predicting Cognitive Effort in Translation Production Yuxiang Wei	17
Computerized Note-taking in Consecutive Interpreting: A Pen-voice Integrated Approach towards Omissions, Additions and Reconstructions in Notes Huolingxiao Kuang	18
Automatization of subprocesses in subtitling Anke Tardel, Silvia Hansen-Schirra, Silke Gutermuth, Moritz Schaeffer	19
Correlating Metaphors to Behavioural Data: A CRITT TPR-DB-based Study Faustino Dardi	21
Exploring Cognitive Effort in Written Translation of Chinese Neologisms: An Eye-tracking and Keylogging Study Jinjin Chen, Defeng Li, Victoria Lei	23

Modelling word translation entropy and syntactic equivalence with machine learning

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Previous research suggests that translation product features such as word translation entropy (WTE) and the degree of syntactic equivalence (SE) correlate with cognitive load (Schaeffer et al. (2016)), and Sun (2015), respectively). WTE quantifies the number of translation choices at word level that a translator is confronted with, whereas SE quantifies the syntactic (dis)similarity between a source and target text. In Vanroy et al. (2019), we found that when a source word has multiple possible translations (WTE), a translator may require more cognitive effort to find the suitable translation; and different syntactic structures of the source segment vis-à-vis the proposed target segment may lead to an increased cognitive effort (SE). Consequently, a high average WTE or dissimilar syntactic structures for a given source text and its translation would indicate that a text was difficult to translate.

The current research aims to predict WTE of a source text as well as its SE to a target text without having access to the actual translation products. We do that by training machine learning (ML) systems on a parallel corpus to model these features. We focus on English to Dutch translation, and we use the Dutch Parallel Corpus (Macken et al. (2011); DPC) as our parallel dataset. Unlike the work done in the Translation Process Research Database (Carl et al., 2016) which uses multiple translations of the same text, we calculate a word's translation entropy based on how it has been translated across the whole corpus. We investigate different ML architectures, and features ranging from the sentence to the morphosyntactic level (for the latter, see Tezcan et al. (2017)). The goal is that by

only feeding a source sentence into the systems, they can predict that sentence's average WTE and SE.

In addition, we investigate whether we can go one step further and use machine translation (MT) systems as an approximation for human translations for the specific task above. This would mean that we do not need human translations nor ML, and that we can confidently use MT to generate a translation and calculate WTE and SE between the source text and the machine translated target text. To explore the feasibility of this approach, we reuse WTE and SE that were calculated on DPC. Then we translate the source text of that corpus with MT and calculate WTE and SE for these translations. Correlating the WTE and SE values from the human translations and those of the MT version indicates how confidently MT can be used as a proxy for human translations in this task.

This study is carried out in the framework of the PreDicT project¹ (Predicting Difficulty in Translation), which aims to develop a translatability prediction system for English-Dutch that not only automatically assigns a global difficulty score to a given source text, but also identifies the passages in the source text that are difficult to translate.

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¹https://research.flw.ugent.be/en/
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