

Visualizing Neural Machine Translation Attention and Confidence

Matīss Rikters^a, Mark Fishel^b, Ondřej Bojar^c

^aFaculty of Computing, University of Latvia

^bInstitute of Computer Science, University of Tartu

^cCharles University, Faculty of Mathematics and Physics, Institute of Formal and Applied Linguistics

E-mail: matiss@lielakeda.lv, fishel@ut.ee, bojar@ufal.mff.cuni.cz

Confidence Scores

$$CDP = \frac{1}{J} \sum_j \log \left(1 + \left(\sum_i \alpha_{ji} \right)^2 \right)$$

$$AP_{out} = -\frac{1}{I} \sum_i \sum_j \alpha_{ji} \cdot \log \alpha_{ji}$$

$$AP_{in} = -\frac{1}{I} \sum_j \sum_i \alpha_{ij} \cdot \log \alpha_{ij}$$

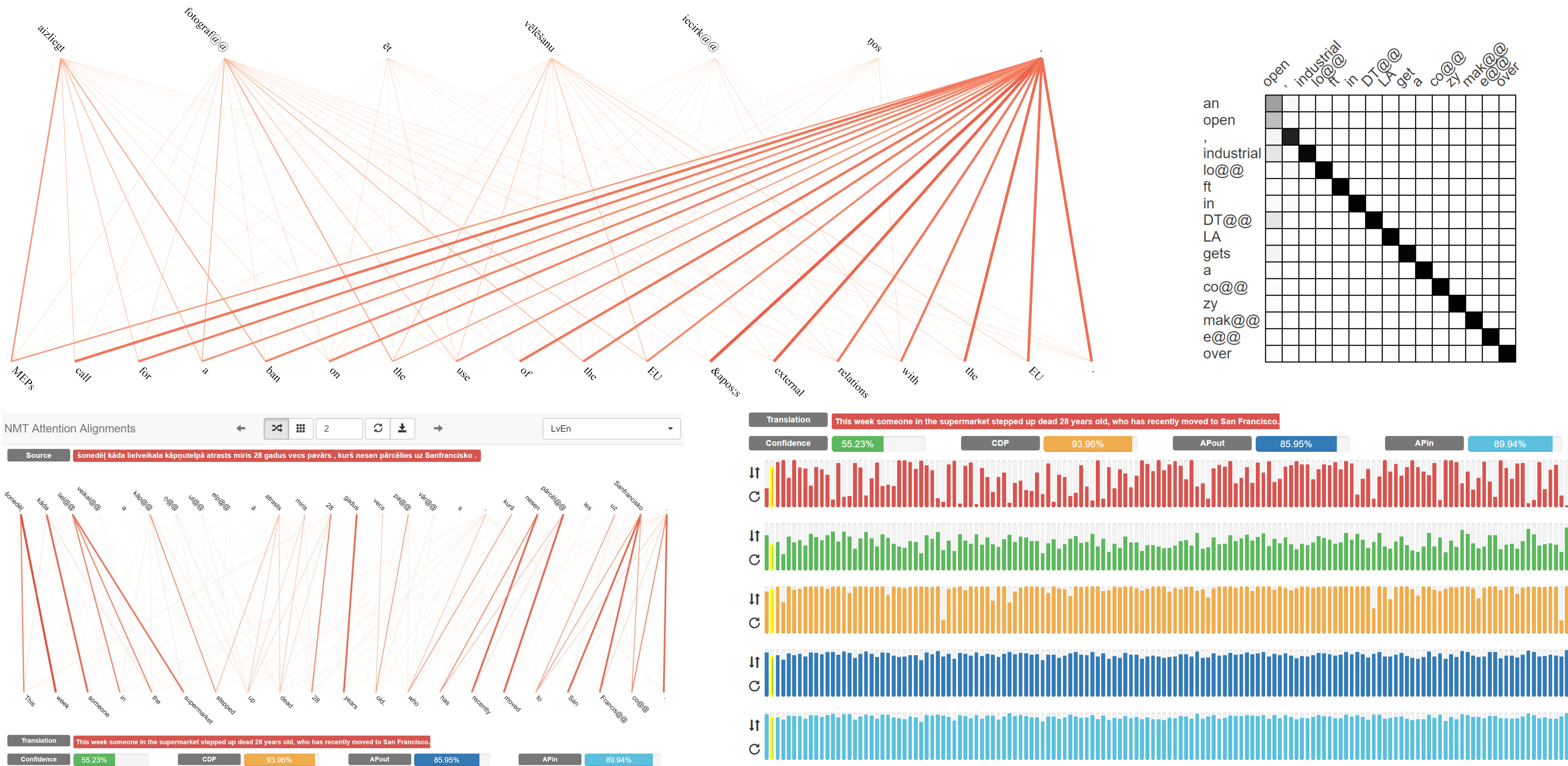
$$confidence = CDP + AP_{out} + AP_{in}$$

percentage = $e^{-C(X^2)}$

Terminal Visualisations



Browser Visualisations



Features

- Works with attention alignment data from
- Nematus
 - Neural Monkey
 - AmuNMT (fork github.com/barvins/amunmt)

- Visualise translations in
- Linux Terminal or Windows PowerShell
 - Web browser
 - Line form or matrix form
 - Save as PNG
 - Sort and navigate dataset by confidence scores

GitHub



ej.uz/nmt-github

Poster



ej.uz/nmt-poster

Demo



ej.uz/nmt-attention

Acknowledgements



This research was supported by the ICT COST Action IC1207 ParseME: Parsing and multi-word expressions - towards linguistic precision and computational efficiency in natural language processing, the grant H2020-ICT-2014-1-645442 (QT21) and Charles University Research Programme "Progres" Q18+Q48.