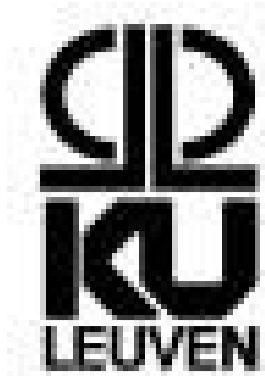


Semantics-based pretranslation for SMT using fuzzy matches

Tom Vanallemeersch, Vincent Vandeghinste
Centre for Computational Linguistics, University of Leuven, Belgium



We propose a method for extending our current fuzzy matching framework with semantic information and SMT pretranslation functionality:

- Use of fuzzy metrics based on lexical semantics and on semantic roles from PropBank/NomBank
- Integration of fuzzy matches with SMT by pretranslating matching parts using word alignment or parse tree alignment
- Use of semantic roles during parse tree alignment

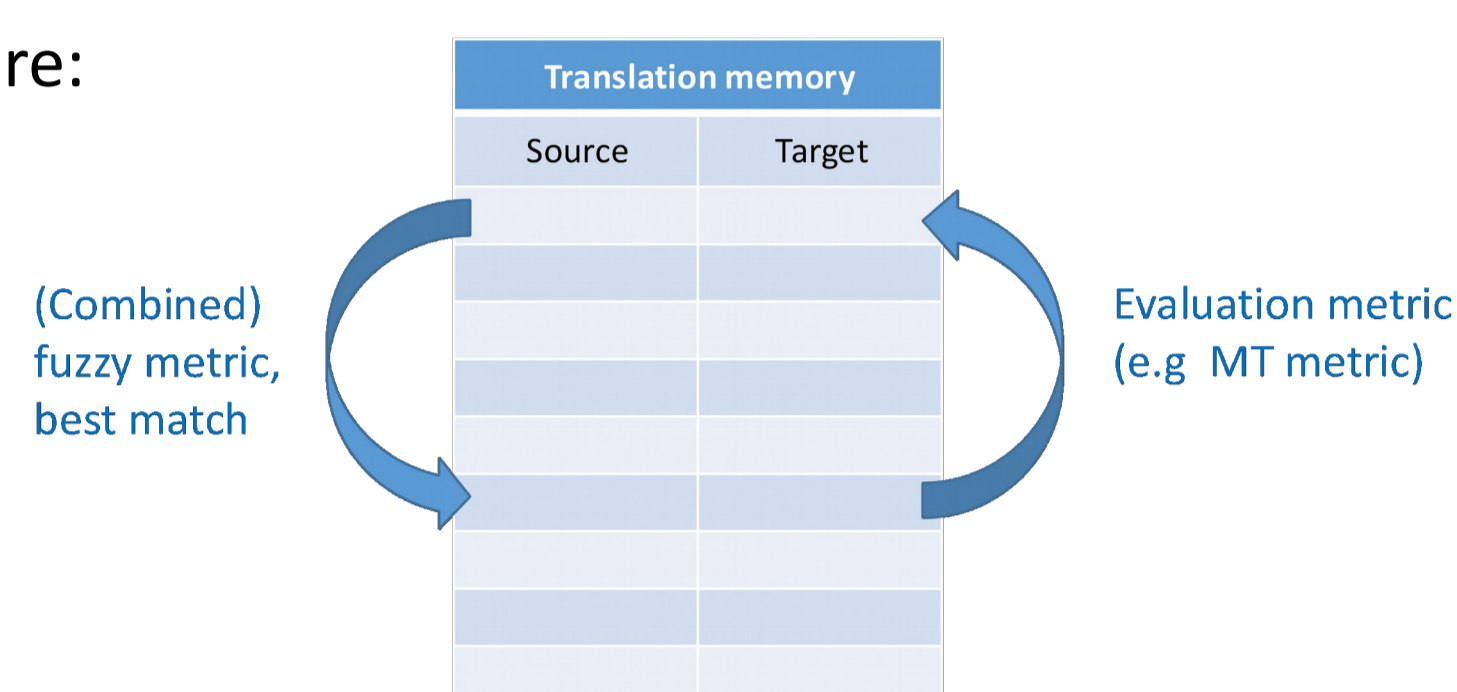
The method has been partially implemented and tested, for English-Dutch.

Fuzzy matching framework

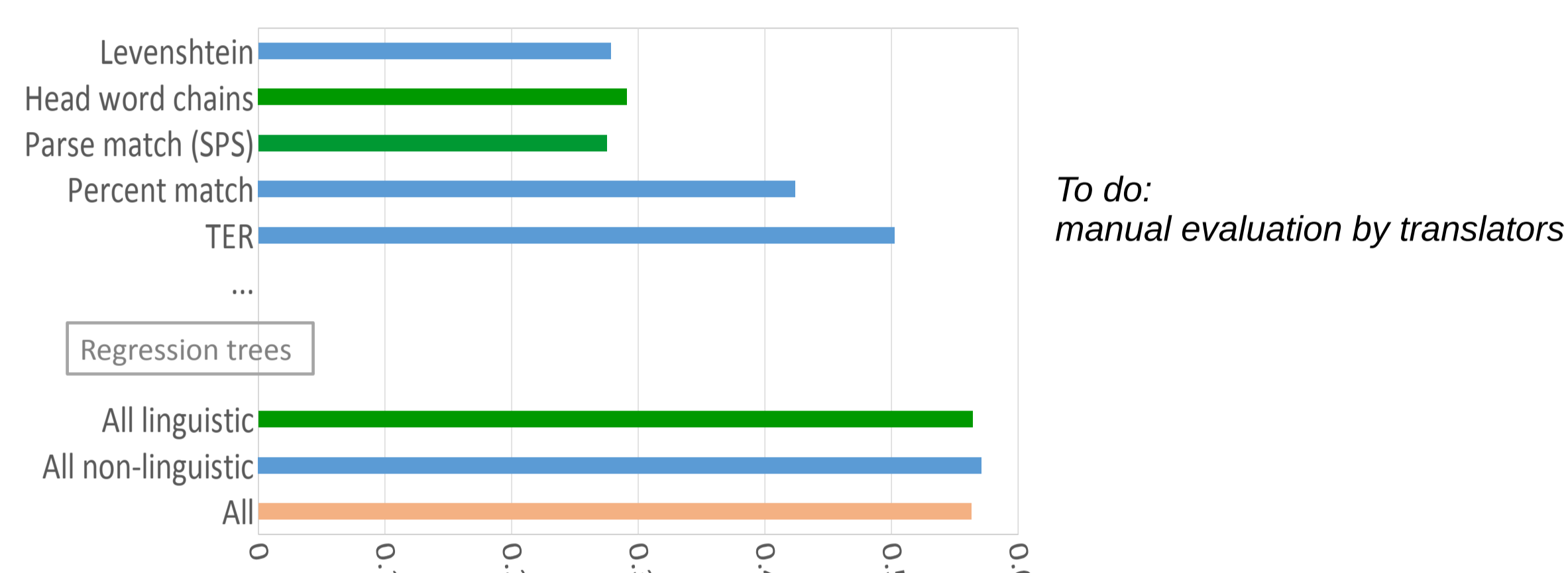
Origin: general-purpose similarity metrics, metrics for MT evaluation, ...

Type: linguistically (un)aware metrics
combined metrics: regression trees with match scores as features
→ predict usability of translation of match

Evaluation procedure:



Correlation of fuzzy metrics with TER (Vanallemeersch and Vandeghinste 2015):

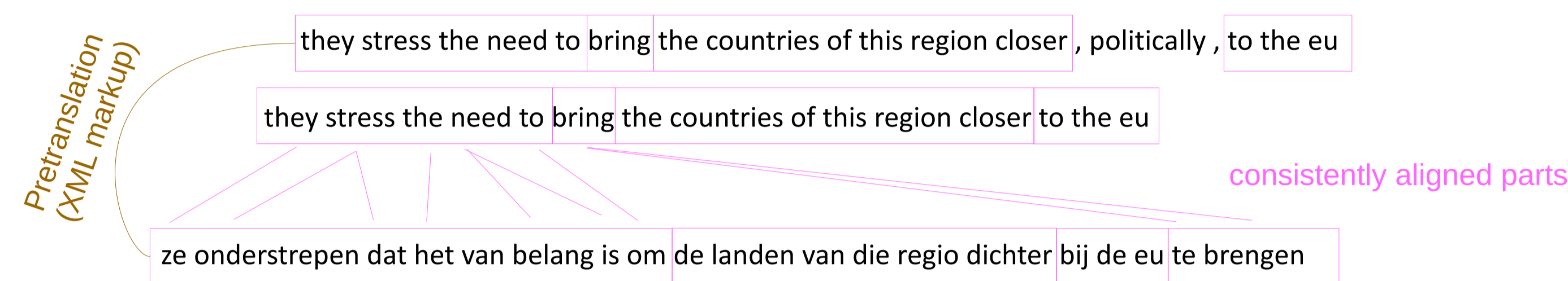


Integration of fuzzy matches with SMT

We are testing two types of alignment for determining matching parts for pretranslation.

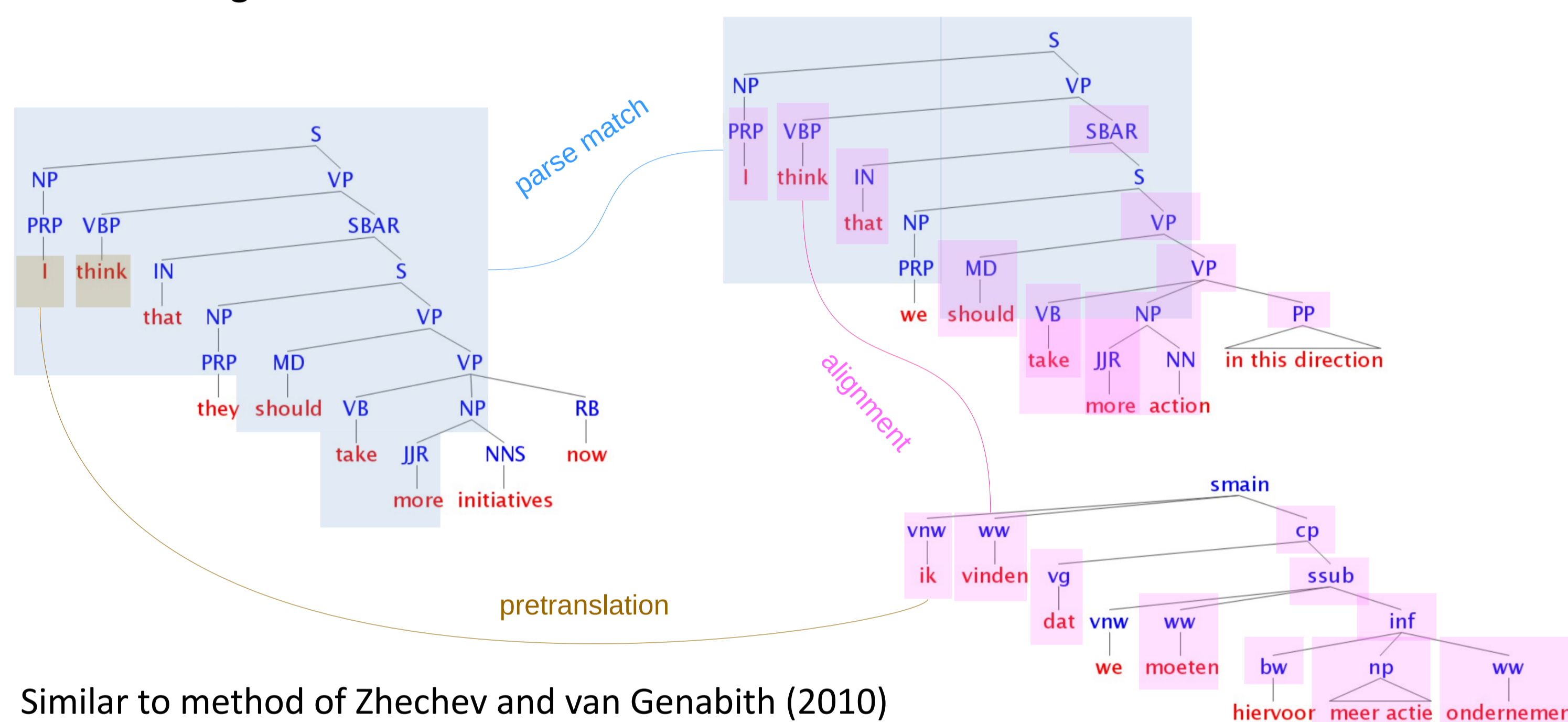
→ Alternatively, the translation of matching parts may be used for target-language edit hints (Esplà-Gomis et al. in press).

Word alignment



Similar to method of Koehn and Senellart (2010)

Parse tree alignment



Similar to method of Zhechev and van Genabith (2010)

Semantics-based fuzzy matching

We are testing fuzzy metrics which use two types of semantics. These metrics can also be applied for evaluating the translation of a fuzzy match.

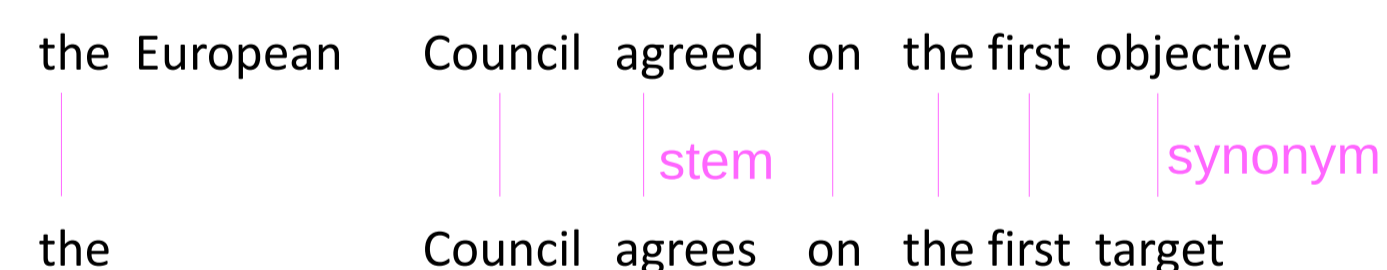
Lexical semantics

METEOR

→ Synonyms from Dutch part of EuroWordNet

→ Paraphrases from English-Dutch phrase pairs: Parex

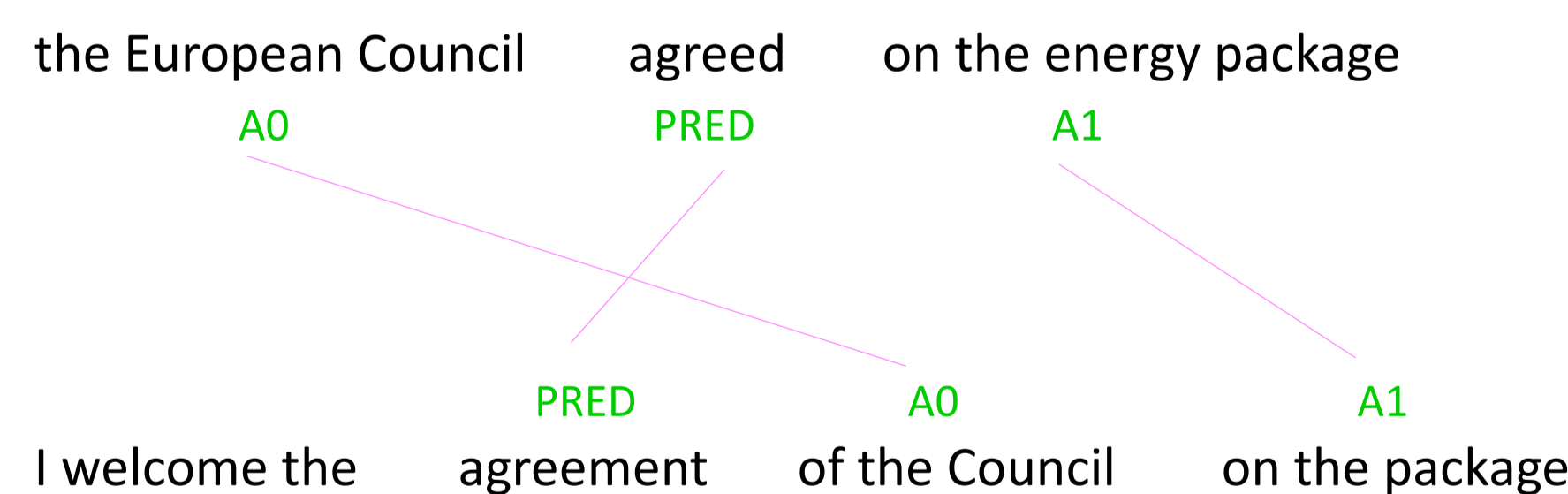
(Denkowski and Lavie 2010; Bannard and Callison-Burch 2005)



Semantic roles

MEANT (Lo and Wu 2011)

SR metrics in Asiya toolkit (Giménez and Márquez 2010)



Levenshtein:

the European Council agreed on the energy package
I welcome the agreement of the Council on the package

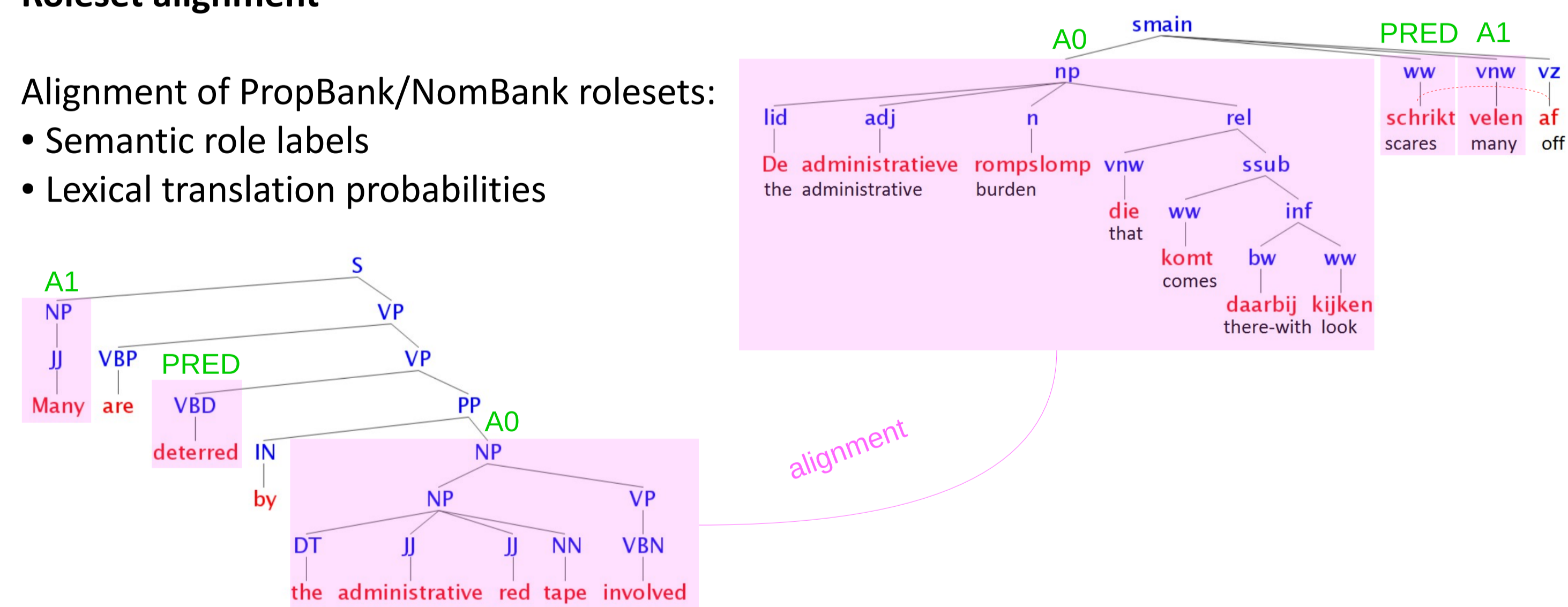
Semantic tree alignment

We are testing two alignment strategies which make use of semantic roles in order to approach the problem of diverging syntactic structures.

Roleset alignment

Alignment of PropBank/NomBank rolesets:

- Semantic role labels
- Lexical translation probabilities



Similar to method of Wu and Palmer (2011)

Semantic features in aligner

Role labels as features in discriminative tree aligner Lingua-Align (Tiedemann 2010)
→ Preliminary tests: improvement of F-score by 3% when abstracting from word alignment

SRL systems

English: System of LTH (Johansson and Nugues 2008) for PropBank/NomBank Swirl (Asiya toolkit)

Dutch: System trained on crosslingual projections from English to Dutch (Vanallemeersch 2012)

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