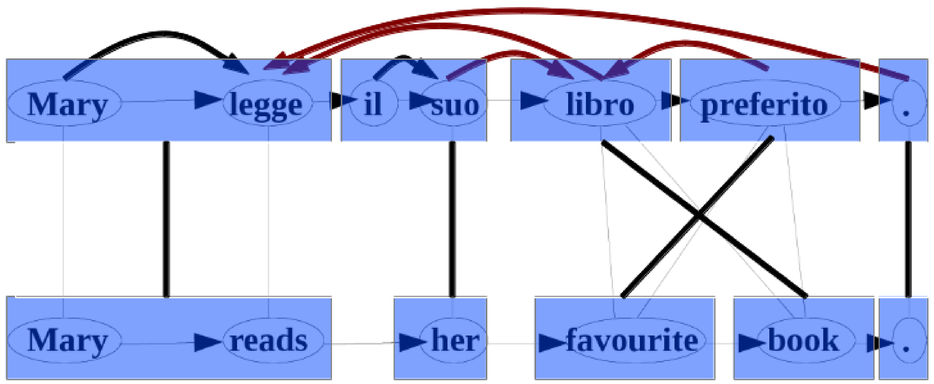
Translation reranking using source phrase dependency features

Antonio Valerio Miceli-Barone
Università di Pisa

Rerank N-best list of translations using source dependency syntax and phrase alignments



Phrase segmentation and one-to-one alignment generated by the phrase-based decoder
Phrase dependencies inspired by Gimpel and Smith (2013)

Results

- Experiments on *it-en* Europarl v7+JRC-ACQUIS v2.2+additional
- Training set size: 3,075,777 s.p.
- Tuning set size: 3,923 s.p.
- Baseline: Moses with sparse features (”word translation” and ”phrase translation” Chiang et al. (2009))
- BLEU:
  - Moses + sparse feats: 29.02
  - Moses + sparse feats. + rerank: 29.17 +0.15

Features

Segmentation: detect syntactic subtree breakage by the decoder
- No PARENTS, no LEFT PARENTS, no RIGHT PARENTS
- Unambiguous PARENTS, un. L. PARENTS, un. R. PARENTS
- Unique PARENT
- No CHILDREN, no L. CHILDREN, no R. CHILDREN
- One-sided CHILDREN

Distortion: detect reordering.
For each pair of source phrases adjacent in target order:
- Unique parent-child / unique child-parent
- Siblings with unique parent
- None of the above

All conjoined with an *inversion feature.*

System

- Train and tune standard phrase-based (Moses) system
- 1000-best decode tuning set
- Parse source sentences with DeSR (Attardi and Ciaramita 2007)
- For each source sentence and candidate translation:
  - Compute phrase dependency features
  - Concatenate with Moses feature vector
- Re-tune Moses linear model on tuning set augmented by phrase dependency features
  - K-best batch MIRA (Cherry and Foster, 2012)
- Use this linear model to rerank candidate translations of new sentences