Multi-Level Alignments as an Extensible Representation Basis for Textual Entailment Algorithms

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1. Task Definition

Task: Recognizing Textual Entailment (Dagan et al., 2006):
Given a text (T) and a hypothesis (H), decide whether the meaning of H can be inferred from T (T → H).

T = The court will make an assessment whether Peter is credible.
H = The judges will evaluate Peter’s credibility.

Generic task that can benefit many NLP applications.

2. Motivation

Prior situation: Little standardization
• Each system developed from scratch
• Comparative evaluation is difficult

Goal: Provide a generic platform for Textual Entailment:
• Easy to apply
• Easy to extend

Step 1: Excitement Open Platform (Padó et al., 2015)
• Specification of a “framework”:
  • Standardization of preprocessing and knowledge resources
  • Easy exchange of resources and analysis pipelines; principled evaluation

Step 2: This paper - multi-level alignments:
• Proposal for a modular, reusable, generic TE algorithm
  • Easy to apply
  • Easy to extend
  • Language-independent

3. Multi-level Alignments Schema

4. Performance on Multiple Languages

<table>
<thead>
<tr>
<th>Evaluation on RTE-3 dataset (accuracy)</th>
<th>Evaluation on Customer Interaction dataset (F1)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>EN</td>
</tr>
<tr>
<td>MultiAlign</td>
<td>67.0</td>
</tr>
<tr>
<td>Best Previous EOP Result</td>
<td>67.0</td>
</tr>
<tr>
<td>RTE-3 median</td>
<td></td>
</tr>
</tbody>
</table>

• Promising results: Competitive with state-of-the-art TE engines on three languages
• Even without language-specific optimizations
• Available as open source software

5. Pilot Application

Aligners:
• Lexical Aligner
• Phrase-based Aligner
• Lemma Identity Aligner

Features:
• Coverage of words in H:
  • All words will, evaluate, Peter, credibility (4/7)
  • Content words will, evaluate, Peter, credibility (4/5)
  • Proper-names Peter (1/1)

References