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Introduction

Separate levels of representation

- NLG: [Tesnière, 1959; Rambow & Korelsky, 1992; Reiter & Dale, 1997; Mellish et al, 2006, Mel’čuk since he was 2 y.o., etc.]
- Prague school, etc.

Three runs submitted

- Surface-syntactic output
  
  Trees, fine-grained syntactic DepRels, all words of sentence

- Deep-syntactic output
  
  Trees, coarse-grained syntactic DepRels, meaning-bearing lexemes

- Predicate-Argument output
  
  Graphs, coarse-grained semantico-syntactic DepRels, meaning-bearing lexemes
At each level, we take into consideration just one type of phenomenon.
but... with several layers, individual annotations are too poor and it makes it all more complicated, doesn’t it?

SSynt

Women, children and men have been forced to leave the village last week

boring
some others may say it is clearer this way, and you can always merge the layers together at little cost

SSynt + DSynt

No constraints of one level onto another level

ah!
Women, children and men have been forced to leave the village last week

SSynt + DSynt + PredArg

Use what you need!
Women, children and men have been forced to leave the village last week.

**Statistical dependency parsing**
*(Bohnet and Nivre 2012)*
Trained on CoNLL’09 dataset

**Rule-based graph-transduction**

<table>
<thead>
<tr>
<th>Grammars</th>
<th>#rul.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ALL</td>
<td>165</td>
<td>Assign default PB/NB IDs. Mark passive, genitive, possessive constructions.</td>
</tr>
<tr>
<td>Pre-Proc. 1</td>
<td>15</td>
<td>Mark hypernodes.</td>
</tr>
<tr>
<td>Post-Proc. 2</td>
<td>23</td>
<td>Remove light verbs. Assign frames (FrameNet).</td>
</tr>
<tr>
<td>Post-Proc. 3</td>
<td>30</td>
<td>Normalize argument numberings.</td>
</tr>
<tr>
<td>Post-Proc. 4</td>
<td>31</td>
<td>Introduce non-core dependencies</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Speed</th>
<th>Memory used</th>
</tr>
</thead>
<tbody>
<tr>
<td>≈ 25 ms/sentence</td>
<td>≈ 300MB</td>
</tr>
</tbody>
</table>
Results

<table>
<thead>
<tr>
<th>Run</th>
<th>Event</th>
<th>Negation</th>
<th>Opinion</th>
<th>Avg.</th>
</tr>
</thead>
<tbody>
<tr>
<td>SSynt</td>
<td>46.54</td>
<td>59.78</td>
<td>63.62</td>
<td>56.65</td>
</tr>
<tr>
<td>DSynt</td>
<td>45.94</td>
<td>33.34</td>
<td>60.42</td>
<td>46.57</td>
</tr>
<tr>
<td>PredArg</td>
<td>46.54</td>
<td>30.67</td>
<td>55.86</td>
<td>44.36</td>
</tr>
</tbody>
</table>

- Downstream applications built on syntactic parses
  - SD (Event, Negation) and CoNLL’08 (Opinion)
  - Expected better results for SSynt: number of nodes?
  - Event Extraction seems more insensitive to the type of input
- Similar structures across participants give different results
  - Impact of missing nodes?
  - Impact of number/labels of dependencies?
  - Impact of type of PoS?
Questions?
Sample hypernode building rule

c:Xi { 
    BLOCK = YES 
    c:deprel = ?dep 
    cid = ?i1 
    c:s-> c:YI { 
        cid = ?i2 
    } 
} 

rc:Yr { 
    rc:<=> ?YI 
    <=> ?XI 
    original_deprel = ?dep 
} 

(?s == PMOD | ?s == IM | ?s == SUB)
A similar technique is almost impossible to apply to other crops.