**Implicit Argument Prediction as Reading Comprehension**

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**Introduction**

Twice in the late 1980s Gillingham came close to winning promotion to the second tier of English football, but a decline then set in...

- We are interested in predicting implicit predicate-argument relations, where the arguments are not syntactically connected to the predicate and may not even be in the same sentence.
- We recently (Cheng & Erk, 2018) proposed a neural model and additional training / testing data for the task.

**Task**

We view the task as reading comprehension.

A predicate-argument tuple with the missing argument is a query.

The answer to the query has to be located in the document.

**Model**

- We draw on the Attentive Reader [1] and Pointer Networks [2].

- A single predicate can have more than one implicit arguments.
- Occurred in over 30% of the G&C dataset (Gerber & Chai, 2010).

- The average interest rate rose to 8.3875% at Citicorp’s $50 million weekly auction of 91-day commercial paper[91-day commercial paper](91-day commercial paper) , or corporate IOUs, from 8.337% at last week’s [sale](sale) .

- We strengthen the model by multi-hop attention computation [3].

**Multi-hop Inference**

- A single predicate can have more than one implicit arguments.

- Occurred in over 30% of the G&C dataset (Gerber & Chai, 2010).

**Results on OntoNotes**

- Comparing to the previous EVENTCOMP model (Cheng & Erk, 2018).
- Our model does much better on the harder ON-LONG dataset with longer documents.

<table>
<thead>
<tr>
<th>Accuracy (%)</th>
<th>On-Short</th>
<th>On-Long</th>
</tr>
</thead>
<tbody>
<tr>
<td>EVENTCOMP</td>
<td>36.90</td>
<td>21.26</td>
</tr>
<tr>
<td>+ entity salience</td>
<td>46.06</td>
<td>31.43</td>
</tr>
<tr>
<td>Our model</td>
<td>58.12</td>
<td>51.52</td>
</tr>
</tbody>
</table>

- Our model performs well on both frequent and infrequent entities out of the box.

**Results on G&C**

- The average interest rate rose to 8.3875% at Citicorp’s $50 million weekly auction of 91-day commercial paper, or corporate IOUs, from 8.337% at last week’s sale.

<table>
<thead>
<tr>
<th>Model</th>
<th>F1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gerber &amp; Chai (2012)</td>
<td>50.3</td>
</tr>
<tr>
<td>GCAUTO* (Gerber &amp; Chai 2012)</td>
<td>44.5</td>
</tr>
<tr>
<td>EventComp</td>
<td>48.3</td>
</tr>
<tr>
<td>Our model</td>
<td>44.4</td>
</tr>
<tr>
<td>+ extra supervision</td>
<td>46.3</td>
</tr>
</tbody>
</table>

* GCAUTO is a re-implementation of Gerber & Chai (2012) by removing gold features for a fair comparison.

**References**