Motivation

What is citation context?

Citation context refers to the sentences or words which state the content from the cited paper. In the figure, the citation context is the yellow highlighted part. The red "[11]" is a citation anchor to the 11th paper in the reference section.

Why do people extract citation context?

- To better evaluate the value of citations
- To reveal manipulation
- To categorize citations
- To do sentiment analysis
- To cluster documents
- To recommend citations and papers
- To disambiguate authors

Why is automated citation context extraction important?

- Citation contexts are important for various applications.
- Too much human effort is needed for manual annotation.
- Automated citation context extraction could help to scale many applications, especially when large amounts of data are needed.

ParsCit

The only automated citation context parsing tool

Data

<table>
<thead>
<tr>
<th>Criteria for ideal corpus</th>
<th>Athar’s corpus</th>
</tr>
</thead>
<tbody>
<tr>
<td>Human annotated or at least human cleaned (Minimum requirement)</td>
<td>✓</td>
</tr>
<tr>
<td>All citation contexts annotated</td>
<td>✓</td>
</tr>
<tr>
<td>Citing papers provided</td>
<td>✓</td>
</tr>
<tr>
<td>In English</td>
<td>✓</td>
</tr>
<tr>
<td>In text format</td>
<td>✓</td>
</tr>
<tr>
<td>Not domain specific</td>
<td>X</td>
</tr>
<tr>
<td>Large data size</td>
<td>✓</td>
</tr>
<tr>
<td>Publicly available</td>
<td>✓</td>
</tr>
</tbody>
</table>

Methods

Input papers in Athar’s corpus to ParsCit. Get ParsCit’s automatically extracted citation contexts.

- Compare the extracted anchor locations with the gold standard.
- Check whether ParsCit locates all citation contexts correctly.

Evaluation metrics

Precision and Recall

- Precision measures how many of ParsCit’s citation anchor locations match the gold standard.
- Recall measures how many citation anchors ParsCit located, from the gold standard.

Evaluation of citation anchor locating

- Recall measures how many tokens of the gold standard are within ParsCit’s scoping window.
- Precision measures how many tokens of ParsCit’s scoping window match the gold standard.

Evaluation of citation context scoping

- Precision measures how many of ParsCit’s citation contexts are within the gold standard.
- Recall measures how many of the gold standard citation contexts are located by ParsCit.

Sample data from Athar’s corpus (our gold standard)

<table>
<thead>
<tr>
<th>Citation anchors</th>
<th>Gold standard citation context</th>
</tr>
</thead>
<tbody>
<tr>
<td>A00-1043</td>
<td>&quot;We analyzed a set of articles and identified six major operations that can be used for editing the extracted sentences, including removing extraneous phrases from an extracted sentence, combining a reduced sentence with other sentences, syntactic transformation, substituting phrases in an extracted sentence with their paraphrases, substituting phrases with more general or specific descriptions, and reordering the extracted sentences (Jing and McKeown, 1999, Jing and McKeown, 2000).&quot;</td>
</tr>
</tbody>
</table>
| A00-2024         | "... Data Civilizer assumes the new schema will obey the dominant enterprise objective of minimizing application maintenance. Hence, it may or may not be a "good" one. There has also been extensive research on automating application rewriting due to database evolution, e.g., [11]. This work focuses on semantic-preserving schema changes. As we noted earlier, DBAs will generally not make such changes because of application risk. Hence, our work focuses on changes that do not necessarily preserve application semantics."

Discussion

- Recall is the most important metric here because we don’t want any information to be lost during extraction.
- Precision is used here to make sure that the auto-extraction doesn’t extract too much unwanted content.

Future work

- Complete the evaluation
- Give recommendations to ParsCit

References