Overview

- Regard predicate-argument (PA) structure as a basic unit of handling the meaning, and perform the matching between text (T) and hypothesis (H) on PA structure.
- Utilize wide coverage relations between words/phrases, which are automatically acquired from a dictionary, Wikipedia, and a Web corpus.

PA Structure Analysis

東京都西多摩地区では、各地で季節を楽しむイベントが開かれる。
(In Tokyo West Tama area, the event, where people enjoy the season every place, is held.)

| 楽しみ (enjoy) | [syn] <enjoy> |
| ラ (acc) 季節 (season) | [syn] <season> |
| デ (loc) 各地 (each place) | [is-a] <place> |
| 開かれる (be held) |

| Pass (n) イベント (event) | [syn] <event> |
| 地区 (area) | [mod] 東京都西多摩 (Tokyo West Tama) |

PA-matching Method

- If all the PAs in H are matched to a PA in T, the system judges “T entails H”.
- Entailment of PAs is defined as follows:
  - The predicate and all the arguments in H are matched to those in T
  - Correspondence of surface form / synonym
  - Distributional similarity between predicates > threshold
  - Args/pred in H are more “general” compared to those in T

SVM-based Method

- Take a machine learning approach (SVM) to consider relatively shallow clues
- Features:
  - Overlap ratio of morphemes and characters
  - Result of PA-matching method (Y/N)
  - ...

Search SubTask

- Given a statement, the system judges the truth or falsity of the statement based on text knowledge base (KB).
- The tasks can be classified into two types:
  - whether a time expression and the time when an event occurred are consistent or not (30%)
    - 16世紀から18世紀の間に、ドイツでは、関税同盟が発足した。
    - (In Germany, custom union started in 1834.)
  - whether an event is true or not (70%)

Experiments

<table>
<thead>
<tr>
<th>Search SubTask</th>
<th>dev</th>
<th>test</th>
</tr>
</thead>
<tbody>
<tr>
<td>KB: Wikipedia</td>
<td>45.74</td>
<td>46.57</td>
</tr>
<tr>
<td>KB: textbook</td>
<td>45.46</td>
<td>45.41</td>
</tr>
<tr>
<td>(containing a time expression only)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- Correct example in PA-matching method (BC)
  - t1: アシガバート空港は、トルクメニスタンの首都アシガバートにある空港である。
    (Ashgabat Airport is an airport that is located in Ashgabat, which is a capital of Turkmenistan.)
  - t2: アシガバートは、トルクメニスタンの首都である。
    (Ashgabat is a capital of Turkmenistan.)

- PA-matching method could not recognize the following synonymous/entailment relation:
  - 連隊長となった = 連隊長に就任した
    (became a regimental commander)
  - 弾け付けにされた → 賢を受けた
    (crucified → take the rap)