Task and basic idea

SV task: Methods based on an extended system of RITE2 for some linguistic phenomena
FV task: One search log method and Two summarization method using our RITE2 system

KitAi on RITE2

Correspondence features
- Word overlap and edit distance between t1 and t2
- Expansion with ontologies; Japanese WordNet and Nihongo-Goi-Taikei

Machine Learning: SVMs, C4.5, etc.

Voting method for the final answer

\[ \text{Score} = \frac{\alpha \times \text{SVM} + \beta \times \text{Logistic} + \gamma \times \text{C4.5}}{3} \]

SV task: Classifier for some linguistic phenomena

Add features
- 5 pattern-based features (binary)
  * e.g., The pattern “X1 to yobu” exists in a sentence t1 or t2 and the pattern “X1 toha ... koto wo iu” or “X1 toha ... de aru” exists in the other sentence. (X1と呼ぶ vs. X1とは...である)
- 5 linguistic phenomenon features (binary)
  * e.g., Case-ga of t1 (or t2) matches Case-wo t2 (or t1)

Add classifiers
- Focusing on 9 majority categories in the unit-test task
  * (1) case_alternation, (2) scrambling, (3) synonymy phrase, (4) modifier, (5) entailment phrase, (6) coreference, (7) clause, (8) relative_clause and (9) implicit_relation.
  - Classifiers are generate for each category, and they are combined with weights

FV task: Search log and summarization methods

Two strategies
- Search log method (MethodFV1)
  * Only search log information; 47 features for SVM
    # of documents in each search result, # of documents retrieved with n-queries, the size of query words from t2, tfidf value in the retrieved documents, and so on.
- Summarization methods: Classification with KitAi by using an estimated t1
  * One sentence extraction (MethodFV2)
    A weighting method about each sentence and the previous and next sentences for personal name, location name, sahen(サ変)-noun, general noun, compound noun
    The method extracts one sentence containing the highest value in the textbook
  * Sentence combination (MethodFV3)
    Step 1. 1st phrase extraction with weights: a phrase with many query words in a short range
    Step 2. 2nd phrase extraction: the most non-similar phrase in the search result against the phrase in Step1
    Step 3. Combine them

<table>
<thead>
<tr>
<th>Method</th>
<th>Macro-F1</th>
<th>Accuracy</th>
<th>CorrectAR</th>
</tr>
</thead>
<tbody>
<tr>
<td>MethodFV1</td>
<td>50.95</td>
<td>58.37</td>
<td>30.27</td>
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<tr>
<td>MethodFV2</td>
<td>56.37</td>
<td>57.59</td>
<td>19.02</td>
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<tr>
<td>MethodFV3</td>
<td>54.65</td>
<td>57.00</td>
<td>28.23</td>
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</tbody>
</table>

MethodFV1: the best Accuracy and CorrectAR
MethodFV2: the best F1 and poor CorrectAR
MethodFV3: better on average.

Experimental result for RITE-2 data

<table>
<thead>
<tr>
<th>Method</th>
<th>Accuracy</th>
</tr>
</thead>
<tbody>
<tr>
<td>KitAi-RITE2</td>
<td>35.67</td>
</tr>
<tr>
<td>KitAi-VAL</td>
<td>38.01</td>
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</tbody>
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The combined method outperformed the non-combined method.