Jointly Preprocessed errant

Evaluation for End-to-End GEC

Refined Evaluation for End-to-End Grammatical Error Correction Using an Alignment-Based Approach

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Procedure example of jp-errant:

1. Preparation	
gold m2	S Kate Ashby , A -1 -1|||noop|||-NONE-|||REQUIRED|||-NONE-|||0 S how are you ? I hope you are well . A 0 1|||R:ADV|||How|||REQUIRED|||-NONE-|||0
stanza m2	S Kate Ashby , how are you ? A -1 -1|||noop|||-NONE-|||REQUIRED|||-NONE-|||0 S I hope you are well . A -1 -1|||noop|||-NONE-|||REQUIRED|||-NONE-|||0
2. Sentence alignment	
gold m2	S Kate Ashby , how are you ? I hope you are well . A -1 -1|||noop|||-NONE-|||REQUIRED|||-NONE-|||0 A 0 1|||R:ADV|||How|||REQUIRED|||-NONE-|||0
stanza m2	S Kate Ashby , how are you ? I hope you are well . A -1 -1|||noop|||-NONE-|||REQUIRED|||-NONE-|||0 A -1 -1|||noop|||-NONE-|||REQUIRED|||-NONE-|||0
3. Re-indexing	
gold m2	S Kate Ashby , how are you ? I hope you are well . A 3 4|||R:ADV|||How|||REQUIRED|||-NONE-|||0
stanza m2	S Kate Ashby , how are you ? I hope you are well . A -1 -1|||noop|||-NONE-|||REQUIRED|||-NONE-|||0

Differences between jp-errant and errant:

jp-errant	errant
S It 's difficult answer at the question " ...	S It 's difficult answer at the question " ...
A 3 3|||M:VERB:FORM|||to|||REQUIRED|||-NONE-|||0	A 3 3|||M:VERB:FORM|||to|||REQUIRED|||-NONE-|||0
A 4 5|||U:PREP||||||REQUIRED|||-NONE-|||0	A 4 5|||U:ADP||||||REQUIRED|||-NONE-|||0
S Thank you for your e - mail , it was wonderful to hear from you .	S Thank you for your e - mail , it was wonderful to hear from you .
A 3 4|||R:PRON|||your|||REQUIRED|||-NONE-|||0	A 3 4|||R:DET|||your|||REQUIRED|||-NONE-|||0
A 7 9|||R:PUNCT|||. It|||REQUIRED|||-NONE-|||0	A 7 9|||R:PUNCT|||. It|||REQUIRED|||-NONE-|||0

Algorithm

function PATTERNMATCHINGSA ($\mathcal{L}$, $\mathcal{R}$):
  while $\mathcal{L}$ and $\mathcal{R}$ **do**
    if $\mathcal{L}_{i(\not\sqcup)} = \mathcal{R}_{j(\not\sqcup)}$ **then**
      $\mathcal{L}', \mathcal{R}' \leftarrow \mathcal{L}' + \mathcal{L}_i, \mathcal{R}' + \mathcal{R}_j$ where $0 < i \leq \text{LEN}(\mathcal{L})$, $0 < j \leq \text{LEN}(\mathcal{R})$
    else
      while $\neg(\mathcal{L}_{i(\not\sqcup)} = \mathcal{R}_{j(\not\sqcup)})$ **do**
        if $\text{LEN}(\mathcal{L}_i) < \text{LEN}(\mathcal{R}_j)$ **then**
          $L' \leftarrow L' + \mathcal{L}_i$
          $i \leftarrow i + 1$
        else
          $R' \leftarrow R' + \mathcal{R}_j$
          $j \leftarrow j + 1$
        end if
      end while
      $\mathcal{L}', \mathcal{R}' \leftarrow \mathcal{L}' + L', \mathcal{R}' + R'$
    end if
  end while
  return $\mathcal{L}', \mathcal{R}'$

The proposed alignment approach addresses inconsistencies caused by tokenization differences in sentence pairs. Sequences $\mathcal{L}_i$ and $\mathcal{R}_j$ are initially aligned by removing spaces to minimize tokenization-induced differences ($\mathcal{L}_i \not\sqcup == \mathcal{R}_j \not\sqcup$). Tokenization variations, such as contractions (e.g., *can't* tokenized as *ca n't* or *can not*), often require more nuanced methods.

Sequences are aligned if their character-level similarity exceeds a threshold α, and subsequent sequences ($\mathcal{L}_{i+1}$, $\mathcal{R}_{j+1}$) also meet similarity or matching criteria (Equation (**??**)). A modified Jaro-Winkler distance, incorporating prefix and suffix scales, calculates α:

$$\alpha = sim_j - \frac{(lp + l'p)(1 - sim_j)}{2} \quad (1)$$

where sim_j is the Jaro similarity between two strings s_1 and s_2, l and l' are the lengths of the common prefix and suffix, and p is a scaling factor (set to 0.1).

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