Sense-Aware Neural Models for Pun Location in Texts
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Introduction
- Homographic Pun
  - One word or phrase that can be interpreted as two different meanings
- Pun instance
  - I used to be a banker but I lost interest
  - interest(profit) or interest(devotion)

Baseline Model (BM)
- Words belong to n. v. adj. adv. are sent to a two-layer feed-forward neural network
- Pun word prediction
  - \( \text{argmax}(y_i) \) and \( y_i > 0.5 \)

Sense-Aware Neural Model (SAM)
- Sense Embedding and WSD
  - Sense Embedding and WSD results obtained by SenseGram (Pelevina et al. 2016)
  - Four WSD results based on different settings and different WSD methods are applied
- Neural Model
  - Replace word embedding and context by sense embedding and WSD results
  - Concatenate different neural model with different WSD results at each time step

Comparison Model (CM)
- Use sense embedding and WSD results instead of word embedding and context
- Do not concatenate different neural model with different WSD results

Results

<table>
<thead>
<tr>
<th>Method</th>
<th>Precision</th>
<th>Recall</th>
<th>F-score</th>
</tr>
</thead>
<tbody>
<tr>
<td>SVM</td>
<td>0.717</td>
<td>0.717</td>
<td>0.717</td>
</tr>
<tr>
<td>CRF</td>
<td>0.759</td>
<td>0.759</td>
<td>0.759</td>
</tr>
<tr>
<td>BM</td>
<td>0.751</td>
<td>0.617</td>
<td>0.677</td>
</tr>
<tr>
<td>CM *</td>
<td>0.754</td>
<td>0.745</td>
<td>0.750</td>
</tr>
<tr>
<td>SAM *</td>
<td>0.815</td>
<td>0.747</td>
<td>0.780</td>
</tr>
<tr>
<td>Idiom Servant **</td>
<td>0.664</td>
<td>0.664</td>
<td>0.664</td>
</tr>
</tbody>
</table>

* There are many different model trained with different combination of WSD results. The performance here are the top performance of each model.
** The best system of SemEval 2017 task 7 subtask 2.

Our proposed SAM model with different groups of WSD results can improve the performance, because different WSD results may provide complementary information for pun location.

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