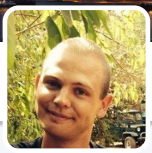
Parser Adaptation for Social Media by Integrating Normalization



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Abstract

This work explores normalization for parser adaptation. Traditionally, normalization is used as separate preprocessing step. We show that integrating the normalization model into the parsing algorithm is beneficial. To this end, we use a normalization model combined with the parsing as intersection algorithm. This way, multiple normalization candidates can be leveraged, which improves parsing performance on social media. We test this hypothesis by modifying the Berkeley parser; out-of-the-box it reaches an F1 score of 66.52. Our integrated approach performs significantly better, with an F1 score of 67.36, while using the best normalization sequence results in an F1 score of only 66.94.

Groningen

July 2017

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www.bitbucket.org/robvanderg/berkeleygraph

www.bitbucket.org/robvanderg/monoise

Previous photos and videos

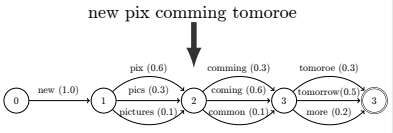

Figure 1: The output of the normalization model for the sentence 'new pix comming tomoroe'.

Corpus	Sents	Words/ sent	Unk%
WSJ (2-21)	39,832	23.9	4.4
EWT	16,520	15.3	3.7
Foster et al. (2011)	269	11.1	9.3
Li and Liu (2014)	2,577	15.7	14.1

Table 1: Some basic statistics for our training and development corpora. % of unknown words (Unk) calculated against the Aspell dictionary ignoring capitalization.

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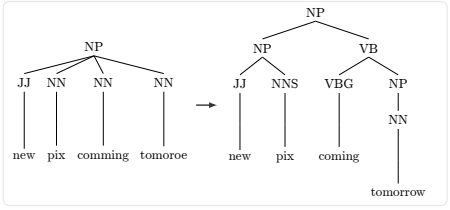
Rob van der Goot @robvanderg · Jan 10

The output of the Berkeley parser on a noisy sentence and its automatically normalized counterpart. #Interesting



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Gertjan van Noord @GJ · Jan 15

That is interesting!, maybe we can use the parsing as intersection algorithm to improve even further? 🙌🙌

34 56 132

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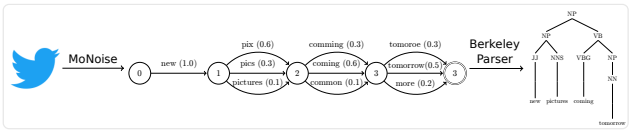
Overview of the model:



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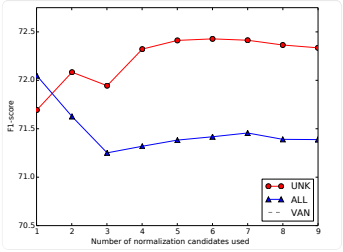
@GJ F1 scores on the development data when integrating multiple candidates while normalizing ALL words or only the UNKnown words:



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But Rob, is this #Significant?

34 56 132

Rob van der Goot @robvanderg · 3h

@GJ, it is! These are the F1 scores of our proposed models and previous work on the test set, trained on the EWT and WSJ, tested on a small Twitter treebank:

Parser	Dev	Test
Stanford parser	66.05	61.95
Berkeley parser	70.85	66.52
Best norm. seq.	72.04	66.94
Integrated norm.	**72.77**	**67.36***
Gold POS tags	74.98	71.80

*#StatisticalSignificant against Berkeley parser at P<0.01 and at P<0.05 against the best normalization sequence using a paired t-test.

1.1k 3.4k 7.5k

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