Effective Inference for Generative Neural Parsing
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Overview
We develop an effective inference procedure for the Choe and Charniak (2016) LSTM language model over linearized parse trees, achieving state-of-the-art single-model performance on the Penn Treebank.

Generative Model

Word-Level Search with Fast-Track Candidates

OPEN Action Pruning

Final Results

Disparities between the log-probabilities of structural vs. word generation actions cause standard beam search to fail.

Grouping candidates by the current word addresses the imbalance in probabilities.

Using the last 2 actions and the next word, we can prune 70% of OPEN actions with negligible effect on F1.

Parser | F1
---|---
Vinylas et al. (2015) | 88.3
Cross and Huang (2016) | 91.3
Dyer et al. (2016) | 91.7
Stern et al. (2017) | 91.79
Our Best Result | 92.56
Our Best Result (with pruning) | 92.53
Vinylas et al. (2015) (ensemble) | 90.5
Choe and Charniak (2016) (rerank) | 92.6
Dyer et al. (2016) (rerank) | 93.3
Fried et al. (2017) (ensemble, rerank) | 94.25