Computational Linguistics

Quarterly (March, June, September, December)
160pp. per issue
6 3/4 x 10
Founded: 1974
2018 Impact Factor: 1.319
2018 Google Scholar h5-index: 32
ISSN: 0891-2017
E-ISSN: 1530-9312

Journal Resources
Editorial Info
Abstracting and Indexing
Release Schedule
Advertising Info

Author Resources
Submission Guidelines
Publication Agreement

Pushdown Automata in Statistical Machine Translation

Cyril Allauzen, Bill Byrne, Adrià de Gispert, Gonzalo Iglesias and Michael Riley

Posted Online September 05, 2014
https://doi.org/10.1162/COLI_a_00197

Computational Linguistics
Volume 40 | Issue 3 | September 2014
p.687-723

Abstract Full Text Authors

This article describes the use of pushdown automata (PDA) in the context of statistical machine translation and alignment under a synchronous context-free grammar. We use PDAs to compactly represent the space of candidate translations generated by the grammar when applied to an input sentence.

Author Reprints

Reader Resources

Rights and Permissions
Most Read
Most Cited

More About Computational Linguistics

Metrics

General-purpose PDA algorithms for replacement, composition, shortest path, and expansion are presented. We describe HiPDT, a hierarchical phrase-based decoder using the PDA representation and these algorithms. We contrast the complexity of this decoder with a decoder based on a finite state automata representation, showing that PDAs provide a more suitable framework to achieve exact decoding for larger synchronous context-free grammars and smaller language models. We assess this experimentally on a large-scale Chinese-to-English alignment and translation task. In translation, we propose a two-pass decoding strategy involving a weaker language model in the first-pass to address the results of PDA complexity analysis. We study in depth the experimental conditions and tradeoffs in which HiPDT can achieve state-of-the-art performance for large-scale SMT.

Forthcoming

Most Read

See More

Lexicon-Based Methods for Sentiment Analysis (13965 times)
Maite Taboada et al.
Computational Linguistics
Volume: 37, Issue: 2, pp. 267-307

Computational Linguistics and Deep Learning (10500 times)
Christopher D. Manning
Computational Linguistics
Volume: 41, Issue: 4, pp. 701-707

Near-Synonymy and Lexical Choice (3653 times)
Philip Edmonds et al.
Computational Linguistics
Volume: 28, Issue: 2, pp. 105-144

(Note that the Most Read numbers are based on the number of full text downloads over the last 12 months.)

Most Cited

See More

Lexicon-Based Methods for Sentiment Analysis (436 times)
Maite Taboada et al.
Computational Linguistics
Volume: 37, Issue: 2, pp. 267-307

A Systematic Comparison of Various Statistical Alignment Models (174 times)
Franz Josef Och et al.
Computational Linguistics
Volume: 29, Issue: 1, pp. 19-51

Opinion Word Expansion and Target Extraction through Double Propagation (147 times)
Guang Qiu et al.
Computational Linguistics
Volume: 37, Issue: 1, pp. 9-27

(Note that the Most Cited numbers are based on Crossref's Cited-by service and reflect citation information for the past 24 months.)