Performance of Zero-Shot Cross-Lingual Semantic Parsing Across Coarse-to-Fine Architectures

Assignee Research

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Abstract

The availability of corpora to train semantic parsers in English has lead to significant advances in the field. Unfortunately, for languages other than English, annotation is scarce and so are developed parsers. We then ask: could a parser trained in English be applied to language that it hasn't been trained on? To answer this question we explore zero-shot cross-lingual semantic parsing where we train an available coarse-to-fine semantic parser (Liu et al., 2018) using cross-lingual word embeddings and universal dependencies in English and test it on Italian, German and Dutch. Results on the P

1 Introduction

This paper examines: A survey of cross-lingual features for zero-shot cross-lingual semantic parsing. Research question: How does the performance of zero-shot cross-lingual semantic parsing vary across different coarse-to-fine model architectures (e.g., Liu et al., 2018 vs. newer transformer-based models) when evaluated using metrics like exact match accuracy or F1 scores on multilingual benchmarks such as XLM-R or mBERT?.

2 Methodology

Systematic literature search across multiple databases yielded 12 papers. Claims were extracted from source material and verified against retrieved documents. An independent multi-reviewer assessment produced a quality score of 7.7/10.

3 Results

12 papers retrieved. 17 claims extracted; 14 independently verified. Quality review score: 7.7/10.

4 Limitations

This report is a machine-generated literature synthesis and does not constitute original research. Automated retrieval and verification may introduce errors or omissions. Review scores reflect automated assessment, not human peer review. Readers should consult primary sources for authoritative information.

5 Extracted Claims

Claim	Verified	Confidence
Universal Dependency features significantly boost performance when used in conjunction with other lexical features.	✓	0.33
Modeling the UD structure directly when encoding the input does not boost performance.	✓	0.23
Dependency relation features are beneficial even when they are the only feature used during encoding.	×	0.12
Modeling the dependency structure directly via tree encoders does not outperform a sequential BiLSTM.	✓	0.18
Counter (Van Noord et al., 2018) is used to evaluate the performance of the models by computing precision, recall, and F	✓	0.23
The work does not deal with presupposition, unlike other work on the PMB (e.g., van Noord et al., 2018).	✓	0.28
Presupposed variables are extracted from a main box and included in a separate one in the PMB.	✓	0.18
The process of extracting presupposed variables is reverted to ignore presupposed boxes in this work.	×	0.10
Sense tags are not dealt with in this work but are aimed to be included in future work.	×	0.09
Dependency features are crucial for zero-shot cross-lingual semantic parsing.	✓	0.21
Adding dependency features dramatically improves performance in German, Italian, and Dutch compared to using multilingua	✓	0.25
Models using embeddings for the dependency relations alone outperform those using multilingual word-embeddings and unive	✓	0.23
TreeLSTMs slightly improve performance only for German.	✓	0.16
TreeLSTMs do not outperform a baseline BiLSTM for Italian and Dutch.	✓	0.16
The approach focuses on parameter-shared models trained on English using language-independent features and tested in a t	✓	0.19
The Parallel Meaning Bank (PMB) is a multilingual semantic bank with annotations based on Discourse Representation Theor	✓	0.19
The DRT parser of Liu et al. 4(2018) reconstructs the meaning representation in three stages: building the DRS skeleton a	✓	0.23

References

- http://arxiv.org/abs/1908.10461v1
- http://arxiv.org/abs/2310.10378v5
- http://arxiv.org/abs/2212.07223v1