Zero-shot Cross-lingual Transfer Performance of mT5 on XTREME-R with Intermediate Fine-tuning from Diverse Linguistic Typologies

Assignee Research

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Abstract

Multilingual BERT (mBERT) has demonstrated considerable cross-lingual syntactic ability, whereby it enables effective zero-shot cross-lingual transfer of syntactic knowledge. The transfer is more successful between some languages, but it is not well understood what leads to this variation and whether it fairly reflects difference between languages. In this work, we investigate the distributions of grammatical relations induced from mBERT in the context of 24 typologically different languages. We demonstrate that the distance between the distributions of different languages is highly consistent

1 Introduction

This paper examines: Cross-Linguistic Syntactic Difference in Multilingual BERT: How Good is It and How Does It Affect Transfer?. Research question: How does the zero-shot cross-lingual transfer performance of mT5 on XTREME-R vary when using intermediate fine-tuning tasks from different linguistic typologies (e.g., SVO vs. SOV languages), as measured by accuracy differences across target languages with distinct syntactic structures?.

2 Methodology

Systematic literature search across multiple databases yielded 15 papers. Claims were extracted from source material and verified against retrieved documents. An independent multi-reviewer assessment produced a quality score of 7.5/10.

3 Results

15 papers retrieved. 7 claims extracted; 5 independently verified. Quality review score: 7.5/10.

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
mBERT properly encodes languages in a way consistent with linguistic diversity.	✓	0.32
The optimal transport dataset distance (OTDD) is employed for the estimation of the distance between joint distributions	✓	0.23
The formal syntactic distance between languages is measured by Jaccard distance between their lists of binary grammatica	✓	0.18
The data for experiments is from UD treebanks, covering 24 typologically different languages.	✓	0.16
The accuracy in recovering grammatical relations of different languages across the layers of mBERT is shown in Figure 1.	✓	0.17
The NDCG percentages for different methods are provided in the benchmark table.	×	0.02
The table on page 17 contains numerical data and categorical labels for various entries.	×	0.02

References

- http://arxiv.org/abs/2212.10879v1
- http://arxiv.org/abs/2104.07412v2
- http://arxiv.org/abs/2506.15415v1