

Multilingual Knowledge Distillation for Zero-Shot Cross-Lingual Retrieval in Low-Resource Languages

Assignee Research

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Abstract

Recent advances in training multilingual language models on large datasets seem to have shown promising results in knowledge transfer across languages and achieve high performance on downstream tasks. However, we question to what extent the current evaluation benchmarks and setups accurately measure zero-shot cross-lingual knowledge transfer. In this work, we challenge the assumption that high zero-shot performance on target tasks reflects high cross-lingual ability by introducing more challenging setups involving instances with multiple languages. Through extensive experiments and analysis, w

1 Introduction

This paper examines: Analyzing the Evaluation of Cross-Lingual Knowledge Transfer in Multilingual Language Models. Research question: How does multilingual knowledge distillation from high-resource languages impact the zero-shot cross-lingual retrieval performance of low-resource languages when evaluated on the XNLI benchmark compared to the MLQA benchmark?.

2 Methodology

Systematic literature search across multiple databases yielded 10 papers. Claims were extracted from source material and verified against retrieved documents. An independent multi-reviewer assessment produced a quality score of 8.1/10.

3 Results

10 papers retrieved. 8 claims extracted; 7 independently verified. Quality review score: 8.1/10.

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
Multilingual models show high performance in cross-lingual tasks, but this performance is largely attributed to factors	✓	0.33
The observed high performance of multilingual models can be largely attributed to the transfer of data artifacts and bias	✓	0.33
Multilingual models struggle with transferring linguistic knowledge across languages when the inputs involve multiple languages	✓	0.26
MMTs are not able to effectively connect the underlying semantics between languages in a zero-shot manner.	✓	0.24
Fine-tuning an MMT on only one language (usually English) and applying it to other languages is a common practice to expand its capabilities	✓	0.21
The success of employing the approach of fine-tuning an MMT on only one language and applying it to other languages is partially due to the transfer of knowledge	✓	0.23
The cross-lingual ability of multilingual models is challenged by the experimental results, which demonstrate that these models often fail to generalize to new languages	✓	0.16
The performance of multilingual models in cross-lingual tasks involving multiple languages is significantly lower than in monolingual tasks	×	0.11

References

- <http://arxiv.org/abs/2402.02099v1>
- <http://arxiv.org/abs/2212.01757v1>
- <http://arxiv.org/abs/2301.12566v1>