Model Merging of Specialized Monolingual Retrievers versus Jointly Trained Multilingual Models for Domain-Specific Cross-Lingual

Assignee Research

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Abstract

In this work we present a systematic empirical study focused on the suitability of the state-of-the-art multilingual encoders for cross-lingual document and sentence retrieval tasks across a number of diverse language pairs. We first treat these models as multilingual text encoders and benchmark their performance in unsupervised ad-hoc sentence- and document-level CLIR. In contrast to supervised language understanding, our results indicate that for unsupervised document-level CLIR – a setup with no relevance judgments for IR-specific fine-tuning – pretrained multilingual encoders on average

1 Introduction

This paper examines: On Cross-Lingual Retrieval with Multilingual Text Encoders. Research question: Does model merging of specialized monolingual retrievers outperform jointly trained multilingual models on domain-specific cross-lingual retrieval tasks?.

2 Methodology

Systematic literature search across multiple databases yielded 4 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

4 papers retrieved. 8 claims extracted; 7 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
The study benchmarks state-of-the-art multilingual encoders for cross-lingual document and sentence retrieval tasks acro	✓	0.27
For unsupervised document-level CLIR without relevance judgments for IR-specific fine-tuning, pretrained multilingual en	✓	0.41
State-of-the-art performance for sentence-level retrieval is achieved by multilingual encoders that have been further sp	✓	0.29
Vanilla 'off-the-shelf' variants of multilingual encoders do not achieve the peak scores for sentence-level retrieval co	✓	0.17
The study introduces localized relevance matching for document-level CLIR where a query is independently scored against	✓	0.17
Multilingual encoders fine-tuned in a supervised fashion on English relevance data were evaluated in zero-shot language	✓	0.30
Supervised re-ranking rarely improves the performance of multilingual transformers when used as unsupervised base ranker	✓	0.22
Performance improvements are observed only with in-domain contrastive fine-tuning.	×	0.13

References

- http://arxiv.org/abs/2112.11031v1
- http://arxiv.org/abs/2605.31171v1
- http://arxiv.org/abs/2511.19324v1