Impact of Bilingual Lexicon Quality on nDCG and MAP Performance in Zero-Shot Cross-Lingual Retrieval with Artificial

Assignee Research

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Abstract

Transferring information retrieval (IR) models from a high-resource language (typically English) to other languages in a zero-shot fashion has become a widely adopted approach. In this work, we show that the effectiveness of zero-shot rankers diminishes when queries and documents are present in different languages. Motivated by this, we propose to train ranking models on artificially code-switched data instead, which we generate by utilizing bilingual lexicons. To this end, we experiment with lexicons induced from (1) cross-lingual word embeddings and (2) parallel Wikipedia page titles. We use

1 Introduction

This paper examines: Boosting Zero-shot Cross-lingual Retrieval by Training on Artificially Code-Switched Data. Research question: What is the impact of bilingual lexicon quality on the nDCG and MAP performance of models trained with artificial code-switching for zero-shot cross-lingual retrieval?.

2 Methodology

Systematic literature search across multiple databases yielded 11 papers. Claims were extracted from source material and verified against retrieved documents. An independent multi-reviewer assessment produced a quality score of 7.3/10.

3 Results

11 papers retrieved. 12 claims extracted; 9 independently verified. Quality review score: 7.3/10.

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 effectiveness of zero-shot rankers diminishes when queries and documents are present in different languages.	✓	0.32
The proposed method trains ranking models on artificially code-switched data generated by utilizing bilingual lexicons.	✓	0.22
The study experiments with lexicons induced from cross-lingual word embeddings.	✓	0.20
The study experiments with lexicons induced from parallel Wikipedia page titles.	✓	0.16
The evaluation uses the mMARCO dataset.	×	0.06
The evaluation covers 36 language pairs spanning Monolingual IR (MoIR), Cross-lingual IR (CLIR), and Multilingual IR (ML	✓	0.30
Code-switching yields a gain of 5.1 MRR@10 in Cross-lingual IR (CLIR).	✓	0.23
Code-switching yields a gain of 3.9 MRR@10 in Multilingual IR (MLIR).	✓	0.19
The proposed approach maintains stable performance in Monolingual IR (MoIR).	×	0.13
Performance gains are up to 2x absolute gain for distant languages.	✓	0.17
The approach is robust towards the ratio of code-switched tokens.	✓	0.23
The approach extends to unseen languages.	×	0.15

References

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