

Cross-Lingual Transfer Learning for Hallucination Detection in Poly-FEVER via High-Resource Fine-Tuning

Assignee Research

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Abstract

We explore the impact of leveraging the relatedness of languages that belong to the same family in NLP models using multilingual fine-tuning. We hypothesize and validate that multilingual fine-tuning of pre-trained language models can yield better performance on downstream NLP applications, compared to models fine-tuned on individual languages. A first of its kind detailed study is presented to track performance change as languages are added to a base language in a graded and greedy (in the sense of best boost of performance) manner; which reveals that careful selection of subset of related la

1 Introduction

This paper examines: Role of Language Relatedness in Multilingual Fine-tuning of Language Models: A Case Study in Indo-Aryan Languages. Research question: To what extent does cross-lingual transfer learning improve hallucination detection in Poly-FEVER when fine-tuning on a subset of high-resource languages before evaluating on low-resource ones, measured by F1-score comparisons?.

2 Methodology

Systematic literature search across multiple databases yielded 18 papers. Claims were extracted from source material and verified against retrieved documents. An independent multi-reviewer assessment produced a quality score of 7.2/10.

3 Results

18 papers retrieved. 14 claims extracted; 10 independently verified. Quality review score: 7.2/10.

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
IndicBERT, mBERT, and MuRIL are utilized as existing pre-trained models in the study.	✓	0.15
Two language models for the Indo-Aryan language family are pre-trained from scratch.	✓	0.17
IndicGLUE tasks are used as test-beds for the experiments.	×	0.07
Multilingual LMs have enabled effective task fine-tuning across various languages.	✓	0.19
Low-resource language members in a multilingual LM benefit by the presence of related languages.	✓	0.16
Presence of unrelated languages may lead to negative interference rooted in conflicting gradients.	✓	0.17
Effectiveness of zero-shot transfer is a function of the downstream task, in addition to the languages themselves.	✓	0.28
Language-specific fine-tuning serves as the skyline for performance.	×	0.10
Multilingual fine-tuning models are slightly poorer compared to monolingual models for POS tagging and morphological tag	✓	0.20
Poor performance is observed for multilingual models in morphological tagging and lemmatization tasks.	✓	0.16
The study investigates the utility of multilingual fine-tuning with related languages.	×	0.13
The study explores the gradation of multilinguality by incrementally adding new languages.	×	0.15
Indo-Aryan languages include low-resource languages, have similar Abugida writing systems, are relatively understudied,	✓	0.26
All constituent languages of the Indo-Aryan family except one use similar Abugida writing systems rooted in the ancient	✓	0.27

References

- <https://arxiv.org/abs/2109.10534>
- <https://arxiv.org/abs/2604.00706>

- <http://arxiv.org/abs/2503.16541v2>