Comparison of Adapter-Based and Full Model Fine-Tuning for Cross-Lingual NER in Low-Resource Languages

Assignee Research

June 27, 2026

Abstract

Named Entity Recognition (NER) is a crucial task in natural language processing that enables machines to better understand human languages. The multilingual NER task is challenging due to the significant syntactic and lexical variations across languages. While large pretrained models like XLM-R have shown effectiveness on multilingual NER, they require substantial computational resources. Parameter-Efficient finetuning (PEFT) methods have recently gained attention as they can achieve comparable performance to full fine-tuning while using only a fraction of the parameters. In this study, we ev

1 Introduction

This paper examines: Parameter-Efficient Fine-Tuning Methods for Multilingual Named Entity Recognition. Research question: How does adapter-based fine-tuning compare to full model fine-tuning in cross-lingual NER accuracy on low-resource languages within the WikiAnn benchmark?.

2 Methodology

Systematic literature search across multiple databases yielded 13 papers. Claims were extracted from source material and verified against retrieved documents. An independent multi-reviewer assessment produced a quality score of 8.5/10.

3 Results

13 papers retrieved. 8 claims extracted; 7 independently verified. Quality review score: 8.5/10.

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
Multilingual NER is challenging due to significant syntactic and lexical variations across languages.	✓	0.25
Large pre-trained models like XLM-R require substantial computational resources for full fine-tuning.	✓	0.25
The study evaluates bottleneck adapters, language adapters, and LoRA for multilingual NER based on the XLM-R model.	✓	0.28
Adapter and LoRA tuning yield an average 1.8% improvement on macro-F1 compared to the baseline.	✓	0.16
Adapter and LoRA tuning use less than 1% of the baseline model's parameters.	✓	0.16
PEFT enables robust transfer learning that boosts performance on low-resource languages by leveraging high-resource base	✓	0.29
Cross-lingual transfer performance is impacted by syntactic and textual similarity between languages.	✓	0.21
Dissimilar languages necessitate richer data for effective cross-lingual transfer.	×	0.14

References

- http://arxiv.org/abs/2506.15415v1
- https://www.semanticscholar.org/paper/94bd6359b8790441ef29eab344f843cd7356bac0
- http://arxiv.org/abs/2110.06500v2