

# Multimodal Data Integration Effects on Cross-Lingual NER F1-Score in Low-Resource Languages

Assignee Research

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## Abstract

Cross-lingual Named Entity Recognition (NER) leverages knowledge transfer between languages to identify and classify named entities, making it particularly useful for low-resource languages. We show that the data-based cross-lingual transfer method is an effective technique for crosslingual NER and can outperform multilingual language models for low-resource languages. This paper introduces two key enhancements to the annotation projection step in cross-lingual NER for low-resource languages. First, we explore refining word alignments using back-translation to improve accuracy. Second, we pres

## 1 Introduction

This paper examines: Revisiting Projection-based Data Transfer for Cross-Lingual Named Entity Recognition in Low-Resource Languages. Research question: How does the integration of multimodal data (images + text) affect the F1-score of cross-lingual NER in low-resource languages compared to projection-based transfer learning methods?.

## 2 Methodology

Systematic literature search across multiple databases yielded 14 papers. Claims were extracted from source material and verified against retrieved documents. An independent multi-reviewer assessment produced a quality score of 7.6/10.

## 3 Results

14 papers retrieved. 12 claims extracted; 9 independently verified. Quality review score: 7.6/10.

## 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 evaluation was performed across a total of 57 languages using the XTREME (39 languages) and MasakhaNER2 datasets (18	✓	0.16
The heuristic word-to-word alignment-based approach by Garca-Ferrero et al. (2022) was reimplemented and enhanced with	✓	0.25
The EasyProject method uses back-translation of labelled source sentences with the NLLB-200-3.3B model for annotation pr	✓	0.22
The XLM-R-Large model, fine-tuned on the English split of the CONLL2003, was used as the source model and for target can	✓	0.17
SimAlign and non-finetuned AWESoME neural aligners were used for computing word-to-word alignments with default settings	×	0.14
The evaluation metrics were influenced by both translation quality and the performance of the NER models.	×	0.12
The proposed approach involving n-gram candidates extraction provides comparable or superior results to heuristics while	✓	0.19
The NER model-based extraction (N) method outperforms the heuristic method (H) in terms of F1 score.	×	0.09
Projection-based data transfer can outperform multilingual language models for low-resource languages in cross-lingual N	✓	0.34
The paper introduces two key enhancements to the annotation projection step: refining word alignments using back-transla	✓	0.33
Data-based methods automate labelling through translation and annotation projection processes.	✓	0.18
Translate-test and translate-train are two approaches for categorization in cross-lingual NER.	✓	0.19

## References

- <http://arxiv.org/abs/2303.09306v2>
- <http://arxiv.org/abs/2509.10975v2>

- <http://arxiv.org/abs/2501.18750v1>