

Cross-lingual NER Projection Techniques and F1 Score Gaps in MLQA Benchmark

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 do different projection-based data transfer techniques in cross-lingual NER compare in terms of F1 score gaps between high-resource and low-resource languages when evaluated on the MLQA 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. 18 claims extracted; 16 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
The evaluation was performed across a total of 57 languages using the XTREME (39 languages) and MasakhaNER2 datasets (18	✓	0.16
The evaluation encompasses the full pipeline, considering both translation and source NER model performance.	✓	0.20
The heuristic word-to-word alignment-based approach outlined by Garca-Ferrero et al. (2022) was reimplemented and enha	✓	0.28
The EasyProject method was reimplemented, which performs back-translation of labelled source sentences using the NLLB-20	✓	0.20
NLLB200-3.3B was employed as a translation model for all experiments.	×	0.12
The XLM-R-Large model, fine-tuned on the English split of the CONLL2003, served as both the source model and for target	✓	0.20
MISC entities predicted by the XLM-R-Large model were ignored in the first set of experiments since this class does not	✓	0.23
SimAlign and non-finetuned AWESoME neural aligners with the default settings were used for computing word-to-word alignm	×	0.14
All models are from the HF Hub, including 2ychenNLP/nllb-200-3.3B-easyproject, facebook/nllb-200-3.3B, and FacebookAI/xl	✓	0.24
The evaluation involved full pipelines, and the resulting metrics were influenced by both translation quality and the pe	✓	0.15
The same models for translation and source labelling were employed throughout all experiments for a fair and consistent	✓	0.16
For tasks involving the proposed integer linear programming (ILP) formulation of the projection problem, a greedy approx	✓	0.21
Candidate matching methods consistently deliver strong performance.	✓	0.16
The proposed approach involving n-gram candidates extraction provides comparable or superior results while offering grea	✓	0.22
The paper introduces two key enhancements to the annotation projection step in cross-lingual NER for low-resource langua 4	✓	0.47
Projection-based data transfer can outperform multilingual language models for low-resource languages.	✓	0.30
Data-based methods automate labelling through translation and annotation projection processes while leveraging advanceme	✓	0.30
Translate test labels original sentences in zero	✓	0.22

References

- <http://arxiv.org/abs/1910.07475v3>
- <http://arxiv.org/abs/1907.11158v1>
- <http://arxiv.org/abs/2501.18750v1>