Can the integration of multimodal data (e.g., text + images) improve the robustness of teacher-student cross-lingual NER models

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: Can the integration of multimodal data (e.g., text + images) improve the robustness of teacher-student cross-lingual NER models on low-resource languages in the ANERCorpus, and how does it compare to text-only approaches in terms of accuracy and inference latency?.

2 Methodology

Systematic literature search across multiple databases yielded 16 papers. Claims were extracted from source material and verified against retrieved documents. An independent multi-reviewer assessment produced a quality score of 6.1/10.

3 Results

16 papers retrieved. 16 claims extracted; 13 independently verified. Quality review score: 6.1/10.

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	✓	0.26
The EasyProject method uses back-translation of labelled source sentences with the NLLB-200-3.3B2 model for annotation p	✓	0.20
NLLB200-3.3B3 was employed as a translation model for all experiments.	×	0.13
The XLM-R-Large model, fine-tuned on the English split of the CONLL2003, served as both the source model and for target	✓	0.18
MISC entities predicted by the XLM-R-Large model were ignored in the first set of experiments.	✓	0.16
SimAlign and non-finetuned AWESoME neural aligners were used for computing word-to-word alignments with default settings	×	0.14
All models are from the HF Hub, including 2ychenNLP/nllb-200-3.3B-easyproject, facebook/nllb-200-3.3B, and FacebookAI/xl	✓	0.25
The evaluation metrics were influenced by both translation quality and the performance of the NER models.	×	0.12
The greedy approximation algorithm was used for tasks involving the proposed integer linear programming (ILP) formulatio	✓	0.20
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	✓	0.43
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-shot settings, while translate-train generates labelled data to train a	✓	0.32

References

- http://arxiv.org/abs/2404.08259v1
- http://arxiv.org/abs/2504.02477v3
- http://arxiv.org/abs/2501.18750v1