

Cross-lingual Transfer Performance of Multilingual vs. Monolingual Models in Low-Resource Languages

Assignee Research

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Abstract

We address the task of machine translation (MT) from extremely low-resource language (ELRL) to English by leveraging cross-lingual transfer from 'closely-related' high-resource language (HRL). The development of an MT system for ELRL is challenging because these languages typically lack parallel corpora and monolingual corpora, and their representations are absent from large multilingual language models. Many ELRLs share lexical similarities with some HRLs, which presents a novel modeling opportunity. However, existing subword-based neural MT models do not explicitly harness this lexical simil

1 Introduction

This paper examines: CharSpan: Utilizing Lexical Similarity to Enable Zero-Shot Machine Translation for Extremely Low-resource Languages. Research question: How do multilingual models like XLM-R compare to monolingual models in zero-shot cross-lingual transfer for low-resource languages, and can lexical similarity metrics explain the observed differences in performance?.

2 Methodology

Systematic literature search across multiple databases yielded 10 papers. Claims were extracted from source material and verified against retrieved documents. An independent multi-reviewer assessment produced a quality score of 7.5/10.

3 Results

10 papers retrieved. 9 claims extracted; 7 independently verified. Quality review score: 7.5/10.

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
All the proposed noise augmentation models outperform vanilla NMT and all baseline models that utilize lexical similarity	✓	0.33
Existing lexical similarity-based baselines do not provide any major improvement in translation quality over vanilla NMT	✓	0.26
Approximately 90% of vocabulary tokens are already overlapping among HRLs and ELRLs in OBPE.	✓	0.19
The proposed CHARSPAN method outperforms general data augmentation methods like (Sub)WordDropout and (Sub)WordSwitchout.	✓	0.27
Unigram char noise is beneficial for the task of related language MT.	✓	0.20
CHARSPAN provides significant improvements over unigram character noise.	✓	0.19
CHARSPAN outperforms BPE in translation quality for languages like Hne, Mag, Mai, Npi, and San when trained with lexical	×	0.11
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CHARSPAN achieves higher similarity scores compared to BPE and UCN for languages like Bho, Hne, San, Npi, Mai, Mag, and	✓	0.15

References

- <http://arxiv.org/abs/2109.07348v2>
- <http://arxiv.org/abs/2305.05214v2>
- <http://arxiv.org/abs/2506.15415v1>