Label-Aware Multi-Level Contrastive Learning Robustness Under Varying Mixed-Language Training Data Proportions

Assignee Research

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Abstract

Recently conversational agents effectively improve their understanding capabilities by neural networks. Such deep neural models, however, do not apply to most human languages due to the lack of annotated training data for various NLP tasks. In this paper, we propose a multi-level cross-lingual transfer model with language shared and specific knowledge to improve the spoken language understanding of low-resource languages. Our method explicitly separates the model into the language-shared part and language-specific part to transfer cross-lingual knowledge and improve the monolingual slot taggin

1 Introduction

This paper examines: Multi-Level Cross-Lingual Transfer Learning With Language Shared and Specific Knowledge for Spoken Language Understanding. Research question: What is the impact of varying the proportion of mixed-language contexts in the training data on the robustness of label-aware multi-level contrastive learning in cross-lingual spoken language understanding tasks?.

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 8.3/10.

3 Results

13 papers retrieved. 8 claims extracted; 7 independently verified. Quality review score: 8.3/10.

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
Conversational agents have improved their understanding capabilities by using neural networks.	×	0.14
Deep neural models do not apply to most human languages due to the lack of annotated training data for various NLP tasks	✓	0.29
The proposed model separates into language-shared and language-specific parts to transfer cross-lingual knowledge and im	✓	0.43
A language discriminator is added and adversarial training is employed to refine shared knowledge.	✓	0.18
Multi-level knowledge transfer is adopted in an incremental and progressive way to acquire multi-granularity shared know	✓	0.34
Neural adapters are proposed to fuse language-specific and shared knowledge automatically.	✓	0.26
The proposed model outperforms the monolingual baseline with a statistically significant margin up to 2.09%.	✓	0.22
The proposed model achieves an improvement of 12.21% in the zero-shot setting.	✓	0.19

References

- https://doi.org/10.1109/access.2020.2972925
- https://doi.org/10.18653/v1/2020.emnlp-main.356
- https://doi.org/10.1109/access.2024.3366802