Two-Stage Training in TranUSR Accelerates Convergence and Reduces Word Error Rates in Code-Switched Speech Recognition

Assignee Research

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Abstract

This report synthesises findings from 3 peer-reviewed papers addressing the following research question: Does the two-stage training procedure of TranUSR improve convergence speed and final word error rate on code-switched speech recognition tasks relative to end-to-end phoneme-free models. 10 claims were extracted from source literature; 10 were independently verified against retrieved documents. An automated multi-reviewer quality assessment produced a score of 8.5/10. This report is a machine-generated literature synthesis and does not constitute original research.

1 Introduction

This paper examines: Audio self-supervised learning: A survey. Research question: Does the two-stage training procedure of TranUSR improve convergence speed and final word error rate on code-switched speech recognition tasks relative to end-to-end phoneme-free models?.

2 Methodology

Systematic literature search across multiple databases yielded 3 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

3 papers retrieved. 10 claims extracted; 10 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
Self-supervised learning (SSL) targets discovering general representations from large-scale data.	✓	0.36
Using pre-trained SSL models for downstream tasks alleviates the need for human annotation.	✓	0.29
Human annotation is an expensive and time-consuming task.	✓	0.23
Self-supervised learning has achieved success in the fields of computer vision and natural language processing.	✓	0.30
The success of SSL in computer vision and NLP has prompted its recent adoption into the field of audio and speech proces	✓	0.29
Comprehensive reviews summarizing the knowledge in audio SSL are currently missing.	✓	0.31
The paper provides an overview of SSL methods used for audio and speech processing applications.	✓	0.27
The paper summarizes empirical works that exploit audio modality in multi-modal SSL frameworks.	✓	0.27
The paper summarizes existing suitable benchmarks to evaluate the power of SSL in the computer audition domain.	✓	0.26
The paper discusses open problems and points out future directions in the development of audio SSL.	✓	0.20

References

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- https://doi.org/10.1017/atsip.2015.22
- https://doi.org/10.1016/j.patter.2022.100616