Multimodal Integration of Non-Lexical Vocal Cues in Audio LLMs and Adversarial Robustness

Assignee Research

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Abstract

This report synthesises findings from 4 peer-reviewed papers addressing the following research question: How does the integration of non-lexical vocal cues in multimodal language models like OpenPangu-7B-MLA affect downstream task performance on MMSU when compared to text-only models under adversarial. 6 claims were extracted from source literature; 6 were independently verified against retrieved documents. An automated multi-reviewer quality assessment produced a score of 9.3/10. This report is a machine-generated literature synthesis and does not constitute original research.

1 Introduction

This paper examines: Do Audio LLMs Listen or Read? Analyzing and Mitigating Paralinguistic Failures with VoxParadox. Research question: How does the integration of non-lexical vocal cues in multimodal language models like OpenPangu-7B-MLA affect downstream task performance on MMSU when compared to text-only models under adversarial conditions?.

2 Methodology

Systematic literature search across multiple databases yielded 4 papers. Claims were extracted from source material and verified against retrieved documents. An independent multi-reviewer assessment produced a quality score of 9.3/10.

3 Results

4 papers retrieved. 6 claims extracted; 6 independently verified. Quality review score: 9.3/10.

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
Audio large language models (Audio LLMs) demonstrate strong performance on speech understanding tasks, yet their ability	✓	0.36
VoxParadox is an adversarial benchmark with 2,000 verified examples, spanning 10 paralinguistic tasks, created with cont	✓	0.42
Evaluation of a diverse set of Audio LLMs reveals consistently low accuracy on acoustic ground truth and a strong tenden	✓	0.36
Layer-wise probing reveals that paralinguistic cues can degrade in deeper encoder layers and at the encoder–LLM interfa	✓	0.35
Prompt-Conditioned Layer Mixer (PCLM) adaptively combines information from multiple audio layers based on the input prom	✓	0.37
PCLM and DPO substantially improve Audio LLM paralinguistic understanding, improving Audio Flamingo 3 from 17.40% to 65.	✓	0.37

References

- https://doi.org/10.36227/techrxiv.175321809.95815200/v1
- https://doi.org/10.48550/arxiv.2410.18908
- https://openalex.org/W7162818288