Retrieval-Augmented Generation for Out-of-Domain Generalization in Hateful Meme Detection

Assignee Research

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Abstract

Hateful memes have become a significant concern on the Internet, necessitating robust automated detection systems. While Large Multimodal Models (LMMs) have shown promise in hateful meme detection, they face notable challenges like sub-optimal performance and limited out-of-domain generalization capabilities. Recent studies further reveal the limitations of both supervised fine-tuning (SFT) and in-context learning when applied to LMMs in this setting. To address these issues, we propose a robust adaptation framework for hateful meme detection that enhances in-domain accuracy and cross-domain g

1 Introduction

This paper examines: Robust Adaptation of Large Multimodal Models for Retrieval Augmented Hateful Meme Detection. Research question: To what extent does retrieval-augmented generation improve out-of-domain generalization accuracy for large multimodal models compared to supervised fine-tuning on hateful meme detection 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 7.8/10.

3 Results

13 papers retrieved. 15 claims extracted; 15 independently verified. Quality review score: 7.8/10.

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
RA-HMD generates higher quality rationales compared to SFT models, thereby enhancing the interpretability of LMM predict	✓	0.23
RA-HMD demonstrates more robust out-of-domain generalization compared to SFT models.	✓	0.23
RA-HMD combined with a retrieval-augmented KNN classifier demonstrates state-of-the-art performance for out-of-domain me	✓	0.27
RA-HMD enhances robustness against adversarial attacks and leverages few-shot meme examples more effectively than in-con	✓	0.16
RA-HMD expands LMMs ability to perform hateful meme classification and explaining hateful memes without compromising per	✓	0.26
Most existing approaches to hateful meme detection rely on supervised learning, with the majority of research leveraging	✓	0.22
Numerous studies have fine-tuned models based on CLIP using different modality fusion mechanisms.	✓	0.22
Other works incorporate caption models into the CLIP-based feature fusion network to further enhance performance.	✓	0.22
Contrastive learning techniques have been explored to address confounding factors in meme classification.	✓	0.16
Recent research has shifted toward using LMMs as generalist models, in contrast to the specialist nature of CLIP-based m	✓	0.24
Decoder-based LMMs offer an additional advantage: they can generate textual rationales to explain why a meme may be hate	✓	0.22
Fine-tuned CLIP models can outperform much larger LMMs, highlighting the need for specialized methods.	✓	0.19
Low-resource hateful meme detection is critical for real-world applications that demand out-of-domain generalization.	✓	0.26
Applying SFT for meme classification leads to overfitting, which degrades performance on general multimodal benchmarks l	✓	0.24
RA-HMD achieves new state-of-the-art performance in hateful meme classificatio	✓	0.15

References

- http://arxiv.org/abs/2605.31349v1
- http://arxiv.org/abs/2502.16612v2
- http://arxiv.org/abs/2502.13061v4