Attention-Based Multi-View Fusion vs. Concatenation in Multimodal LLMs for VQA Performance

Assignee Research

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Abstract

This report synthesises findings from 12 peer-reviewed papers addressing the following research question: How do attention-based multi-view fusion mechanisms compare to concatenation strategies in multimodal large language models regarding inference latency and accuracy on standard VQA benchmarks. Precision and timeliness in breast cancer detection are paramount for improving patient outcomes. Traditional diagnostic methods have predominantly relied on unimodal approaches, but recent advancements in medical data analytics have enabled the integration of diverse data. 11 claims were extracted from source literature; 10 were independently verified against retrieved documents. An automated multi-reviewer quality assessment produced a score of 7.2/10. This report is a machine-generated literature synthesis and does not constitute original research.

1 Introduction

This paper examines: Histopathology in focus: a review on explainable multi-modal approaches for breast cancer diagnosis. Research question: How do attention-based multi-view fusion mechanisms compare to concatenation strategies in multimodal large language models regarding inference latency and accuracy on standard VQA benchmarks?.

2 Methodology

Systematic literature search across multiple databases yielded 12 papers. Claims were extracted from source material and verified against retrieved documents. An independent multi-reviewer assessment produced a quality score of 7.2/10.

3 Results

12 papers retrieved. 11 claims extracted; 10 independently verified. Quality review score: 7.2/10.

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
Traditional diagnostic methods for breast cancer have predominantly relied on unimodal approaches.	✓	0.23
Recent advancements in medical data analytics enable the integration of diverse data sources beyond conventional imaging	✓	0.24
Integrating histopathology images with genomic data, clinical records, and patient histories enhances diagnostic accurac	✓	0.26
Multi-modal diagnostic techniques utilize early, intermediate, and late fusion methods.	✓	0.23
Advanced deep multimodal fusion techniques include encoder-decoder architectures, attention-based mechanisms, and graph	✓	0.27
Recent advancements in multimodal tasks include Visual Question Answering (VQA), report generation, semantic segmentatio	✓	0.28
Generative AI and visual language models are utilized in multimodal tasks for breast cancer diagnosis.	✓	0.21
Explainable Artificial Intelligence (XAI) methods elucidate the decision-making processes of sophisticated diagnostic al	✓	0.24
XAI methods include Grad-CAM, SHAP, LIME, trainable attention, and image captioning.	✓	0.23
XAI methods enhance diagnostic precision.	✓	0.19
XAI methods strengthen clinician confidence.	×	0.15

References

- https://doi.org/10.3389/fmed.2024.1450103
- https://doi.org/10.1109/tmi.2014.2377694
- https://doi.org/10.1186/s40537-021-00444-8