Quantized Inference Impact on Low-Resource Vision-Language Model Performance

Assignee Research

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Abstract

This report synthesises findings from 20 peer-reviewed papers addressing the following research question: How does quantized inference affect task performance on low-resource vision-language benchmarks. Multimodal Large Language Models (MLLM), which integrate large language models (LLMs) with vision models, aim to overcome the text-centric limitations of traditional LLMs. While models like GPT-4 and PaLM-E excel at processing text data, they face limitations in complex fields. 10 claims were extracted from source literature; 9 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: Strategic Application of Prompt Engineering in Multi-Modal Large Language Models. Research question: How does quantized inference affect task performance on low-resource vision-language benchmarks?.

2 Methodology

Systematic literature search across multiple databases yielded 20 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

20 papers retrieved. 10 claims extracted; 9 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
Multimodal Large Language Models (MLLM) integrate large language models (LLMs) with vision models.	✓	0.29
Traditional LLMs have text-centric limitations.	✓	0.17
GPT-4 and PaLM-E excel at processing text data.	✓	0.22
GPT-4 and PaLM-E face limitations in medical image analysis and cross-modality reasoning.	✓	0.25
MLLMs combine textual and non-linguistic data, such as images, to enhance understanding and reasoning.	✓	0.22
The study evaluates three MLLMs: Llama-3.2, Phi-3.5, and Qwen2–VL.	✓	0.17
The study uses the Flickr30k, NoCaps, and MSCOCO datasets for evaluation.	×	0.10
The study analyzes model performance on image captioning, object recognition, and scene understanding tasks.	✓	0.20
Chain-of-Thought (CoT) is more effective than In-Context Learning (ICL) for tasks requiring logical reasoning.	✓	0.28
In-Context Learning (ICL) enhances model adaptability across diverse scenarios more effectively than Chain-of-Thought (C	✓	0.24

References

- http://arxiv.org/abs/2602.13289v1
- https://www.semanticscholar.org/paper/c15653a6b52e24efaa806697a04a43c7851bacf1
- https://www.semanticscholar.org/paper/2bf7b7031c5697320de370c531ad2503ad4dac12