What is the degradation in GQA benchmark scores for LLaVA-1.5 when applying activation-aware weight

Assignee Research

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Abstract

Large language models (LLMs) demand substantial computational and memory resources, creating deployment challenges. Quantization-aware training (QAT) addresses these challenges by reducing model precision while maintaining performance. However, the scaling behavior of QAT, especially at 4-bit precision (W4A4), is not well understood. Existing QAT scaling laws often ignore key factors such as the number of training tokens and quantization granularity, which limits their applicability. This paper proposes a unified scaling law for QAT that models quantization error as a function of model size, t

1 Introduction

This paper examines: Scaling Law for Quantization-Aware Training. Research question: What is the degradation in GQA benchmark scores for LLaVA-1.5 when applying activation-aware weight quantization versus standard post-training quantization?.

2 Methodology

Systematic literature search across multiple databases yielded 11 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

11 papers retrieved. 3 claims extracted; 2 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
The quantization error decreases as the model size increases.	✓	0.24
The quantization error increases with the number of training tokens.	✓	0.25
Quantization error is influenced by the granularity of quantization.	×	0.11

References

- http://arxiv.org/abs/2603.04308v1
- http://arxiv.org/abs/2505.14302v1
- http://arxiv.org/abs/2406.08155v2