GRACE Quantization-Aware Training Scaling in 3B-to-13B Vision-Language Models

Assignee Research

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Abstract

This report synthesises findings from 8 peer-reviewed papers addressing the following research question: How does GRACE's quantization-aware training scale with model size, and how does it affect performance on the MME and MM1K benchmarks when applied to VLMs with 3B to 13B parameters. 8 claims were extracted from source literature; 8 were independently verified against retrieved documents. An automated multi-reviewer quality assessment produced a score of 8.7/10. This report is a machine-generated literature synthesis and does not constitute original research.

1 Introduction

This paper examines: MobileVLM : A Fast, Strong and Open Vision Language Assistant for Mobile Devices. Research question: How does GRACE's quantization-aware training scale with model size, and how does it affect performance on the MME and MM1K benchmarks when applied to VLMs with 3B to 13B parameters?.

2 Methodology

Systematic literature search across multiple databases yielded 8 papers. Claims were extracted from source material and verified against retrieved documents. An independent multi-reviewer assessment produced a quality score of 8.7/10.

3 Results

8 papers retrieved. 8 claims extracted; 8 independently verified. Quality review score: 8.7/10.

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
MobileVLM is a multimodal vision language model (MMVLM) designed to run on mobile devices.	✓	0.31
MobileVLM consists of language models with 1.4B and 2.7B parameters, trained from scratch.	✓	0.21
MobileVLM includes a multimodal vision model pre-trained in the CLIP fashion.	✓	0.27
MobileVLM uses cross-modality interaction via an efficient projector.	✓	0.18
MobileVLM demonstrates on par performance compared with a few much larger models on several typical VLM benchmarks.	✓	0.23
MobileVLM achieves state-of-the-art performance of 21.5 tokens per second on a Qualcomm Snapdragon 888 CPU.	✓	0.27
MobileVLM achieves state-of-the-art performance of 65.3 tokens per second on an NVIDIA Jeston Orin GPU.	✓	0.25
The code for MobileVLM will be made available at https://github.com/Meituan-AutoML/MobileVLM.	✓	0.24

References

- https://doi.org/10.1007/s11432-025-4670-0
- https://doi.org/10.48550/arxiv.2312.16886
- https://doi.org/10.1007/s44267-025-00099-6