Million-Token Context Windows and Multimodal Reasoning in Gemini 1.5 Pro

Assignee Research

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Abstract

This report synthesises findings from 14 peer-reviewed papers addressing the following research question: What is the impact of million-token context windows on multimodal reasoning accuracy in Gemini 1.5 Pro versus prior versions. 11 claims were extracted from source literature; 10 were independently verified against retrieved documents. An automated multi-reviewer quality assessment produced a score of 7.9/10. This report is a machine-generated literature synthesis and does not constitute original research.

1 Introduction

This paper examines: Capabilities of Gemini Models in Medicine. Research question: What is the impact of million-token context windows on multimodal reasoning accuracy in Gemini 1.5 Pro versus prior versions?.

2 Methodology

Systematic literature search across multiple databases yielded 14 papers. Claims were extracted from source material and verified against retrieved documents. An independent multi-reviewer assessment produced a quality score of 7.9/10.

3 Results

14 papers retrieved. 11 claims extracted; 10 independently verified. Quality review score: 7.9/10.

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
Gemini models have strong general capabilities in multimodal and long-context reasoning.	✓	0.27
Med-Gemini is a family of highly capable multimodal models specialized in medicine.	✓	0.26
Med-Gemini can seamlessly use web search.	✓	0.19
Med-Gemini can be efficiently tailored to novel modalities using custom encoders.	✓	0.24
Med-Gemini was evaluated on 14 medical benchmarks.	×	0.14
Med-Gemini established new state-of-the-art (SoTA) performance on 10 of the 14 medical benchmarks.	✓	0.23
Med-Gemini surpasses the GPT-4 model family on every benchmark where a direct comparison is viable, often by a wide marg	✓	0.26
On the MedQA (USMLE) benchmark, Med-Gemini's best-performing model achieves SoTA performance of 91.1% accuracy using a n	✓	0.34
On 7 multimodal benchmarks including NEJM Image Challenges and MMMU (health & medicine), Med-Gemini improves over GPT-4V	✓	0.36
Med-Gemini demonstrates SoTA performance on a needle-in-a-haystack retrieval task from long de-identified health records	✓	0.32
Med-Gemini surpasses prior bespoke methods using only in-context learning.	✓	0.20

References

- https://doi.org/10.48550/arxiv.2404.18416
- https://doi.org/10.48550/arxiv.2307.06435
- https://doi.org/10.48550/arxiv.2403.05530