Inference Efficiency and Alignment Trade-offs in Fine-Tuned Llama3-70B and Codestral-7B

Assignee Research

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Abstract

This report synthesises findings from 10 peer-reviewed papers addressing the following research question: How does the inference efficiency (measured in tokens/sec or latency) of Llama3-70B and Codestral-7B change across fine-tuning iterations, and does this correlate with their alignment scores on. Large language models (LLMs) have emerged as powerful tools in chemistry, significantly impacting molecule design, property prediction, and synthesis optimization. This review highlights LLM capabilities in these domains and their potential to accelerate scientific discovery. 7 claims were extracted from source literature; 7 were independently verified against retrieved documents. An automated multi-reviewer quality assessment produced a score of 7.5/10. This report is a machine-generated literature synthesis and does not constitute original research.

1 Introduction

This paper examines: A review of large language models and autonomous agents in chemistry. Research question: How does the inference efficiency (measured in tokens/sec or latency) of Llama3-70B and Codestral-7B change across fine-tuning iterations, and does this correlate with their alignment scores on SECURITYBENCH?.

2 Methodology

Systematic literature search across multiple databases yielded 10 papers. Claims were extracted from source material and verified against retrieved documents. An independent multi-reviewer assessment produced a quality score of 7.5/10.

3 Results

10 papers retrieved. 7 claims extracted; 7 independently verified. Quality review score: 7.5/10.

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
Large language models (LLMs) have emerged as powerful tools in chemistry.	✓	0.25
LLMs significantly impact molecule design, property prediction, and synthesis optimization in chemistry.	✓	0.21
LLM-based autonomous agents are defined as LLMs equipped with a broader set of tools to interact with their surrounding	✓	0.25
Autonomous agents perform tasks such as paper scraping, interfacing with automated laboratories, and synthesis planning.	✓	0.31
Key challenges in the field include data quality and integration, model interpretability, and the need for standard benc	✓	0.25
Future directions in the field point towards more sophisticated multi-modal agents and enhanced collaboration between ag	✓	0.31
A repository tracking the latest studies on LLMs in science is hosted at https://github.com/ur-whitelab/LLMs-in-science.	✓	0.20

References

- https://doi.org/10.1057/s41599-024-03611-3
- https://doi.org/10.48550/arxiv.2303.17564

- https://doi.org/10.1039/d4sc03921a