DeepSeek R1, Llama3, and Codestral Robustness Under Adversarial Code Perturbations

Assignee Research

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Abstract

This report synthesises findings from 9 peer-reviewed papers addressing the following research question: How does the accuracy degradation of Deepseek R1 compare to Llama3 and Codestral under adversarial code perturbations across diverse programming languages in the Big-Vul dataset. 4 claims were extracted from source literature; 4 were independently verified against retrieved documents. An automated multi-reviewer quality assessment produced a score of 7.7/10. This report is a machine-generated literature synthesis and does not constitute original research.

1 Introduction

This paper examines: CodeMMLU: A Multi-Task Benchmark for Assessing Code Understanding & Reasoning Capabilities of CodeLLMs. Research question: How does the accuracy degradation of Deepseek R1 compare to Llama3 and Codestral under adversarial code perturbations across diverse programming languages in the Big-Vul dataset?.

2 Methodology

Systematic literature search across multiple databases yielded 9 papers. Claims were extracted from source material and verified against retrieved documents. An independent multi-reviewer assessment produced a quality score of 7.7/10.

3 Results

9 papers retrieved. 4 claims extracted; 4 independently verified. Quality review score: 7.7/10.

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
CodeMMLU is a multiple-choice benchmark designed to evaluate the depth of software and code comprehension in LLMs.	✓	0.31
CodeMMLU includes nearly 20,000 questions spanning diverse domains, including code analysis, defect detection, and softw	✓	0.40
CodeMMLU assesses a model's ability to reason about programs across a wide-range of tasks such as code repair, execution	✓	0.36
State-of-the-art models struggle with CodeMMLU, highlighting significant gaps in comprehension beyond generation.	✓	0.29

References

- https://doi.org/10.1007/s12243-022-00926-7
- https://doi.org/10.48550/arxiv.2410.01999
- https://doi.org/10.1109/comst.2023.3273282