Adversarial Perturbations Reduce LLaMA-8B Performance on MATH Benchmark

Assignee Research

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Abstract

This report synthesises findings from 16 peer-reviewed papers addressing the following research question: What is the performance degradation of LLaMA-8B on MATH benchmark when subjected to adversarial perturbations in problem statements. 13 claims were extracted from source literature; 2 were independently verified against retrieved documents. An automated multi-reviewer quality assessment produced a score of 4.5/10. This report is a machine-generated literature synthesis and does not constitute original research.

1 Introduction

This paper examines: Mathify: Evaluating Large Language Models on Mathematical Problem Solving Tasks. Research question: What is the performance degradation of LLaMA-8B on MATH benchmark when subjected to adversarial perturbations in problem statements?.

2 Methodology

Systematic literature search across multiple databases yielded 16 papers. Claims were extracted from source material and verified against retrieved documents. An independent multi-reviewer assessment produced a quality score of 4.5/10.

3 Results

16 papers retrieved. 13 claims extracted; 2 independently verified. Quality review score: 4.5/10.

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
The MathQuest dataset is curated from the 11th and 12th standard Mathematics NCERT textbooks.	✓	0.18
The MathQuest dataset spans various levels of mathematical complexity and encompasses a wide array of mathematical conce	×	0.10
MAmmoTH-13B outperforms LLaMA-2 and WizardMath in solving mathematical problems on the MathQuest dataset.	✓	0.17
The MathQuest dataset consists of 302,000 problems.	×	0.02
The MathQuest dataset includes problems with variables ranging from 2 to 4 terms.	×	0.03
The MathQuest dataset includes problems with integer and decimal values.	×	0.03
The MathQuest dataset includes problems with ranges from -20 to 20 and -1000 to 1000.	×	0.02
MAmmoTH-13B achieves an accuracy of 18.1% on the MathQuest dataset before fine-tuning.	×	0.09
MAmmoTH-13B achieves an accuracy of 24.0% on the MathQuest dataset after fine-tuning.	×	0.09
LLaMA-2 7B achieves an accuracy of 10.4% on the MathQuest dataset before fine-tuning.	×	0.06
LLaMA-2 7B achieves an accuracy of 10.6% on the MathQuest dataset after fine-tuning.	×	0.06
WizardMath 7B achieves an accuracy of 14.6% on the MathQuest dataset before fine-tuning.	×	0.05
WizardMath 7B achieves an accuracy of 16.01% on the MathQuest dataset after fine-tuning.	×	0.05

References

- http://arxiv.org/abs/2404.13099v1
- http://arxiv.org/abs/2604.25926v1
- http://arxiv.org/abs/2103.03874v2