

Instruction Tuning with Code Security Examples Enhances Llama3 Zero-Shot Vulnerability Detection

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Abstract

This report synthesises findings from 8 peer-reviewed papers addressing the following research question: How does instruction tuning with code security examples improve Llama3's zero-shot performance on the Big-Vul dataset compared to general code instruction tuning. Large Language Models (LLMs) have demonstrated significant capabilities in understanding and analyzing code for security vulnerabilities, such as Common Weakness Enumerations (CWEs). However, their reliance on cloud infrastructure and substantial computational requirements pose. 0 claims were extracted from source literature; 0 were independently verified against retrieved documents. An automated multi-reviewer quality assessment produced a score of 3.3/10. This report is a machine-generated literature synthesis and does not constitute original research.

1 Introduction

This paper examines: Case Study: Fine-tuning Small Language Models for Accurate and Private CWE Detection in Python Code. Research question: How does instruction tuning with code security examples improve Llama3's zero-shot performance on the Big-Vul dataset compared to general code instruction tuning?.

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 3.3/10.

3 Results

8 papers retrieved. 0 claims extracted; 0 independently verified. Quality review score: 3.3/10.

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.

References

- <http://arxiv.org/abs/2304.07995v1>
- <http://arxiv.org/abs/2504.16584v1>
- <http://arxiv.org/abs/2508.11281v3>