

Natural Language Commit Messages Enhance Vulnerability Detection in Code Property Graphs

Assignee Research

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Abstract

This report synthesises findings from 15 peer-reviewed papers addressing the following research question: How does incorporating natural language commit messages into code property graph representations impact the F1-score of vulnerability detection models on the Big-Vul dataset compared to graph-only. A commit message describes the main code changes in a commit and plays a crucial role in software maintenance. Existing commit message generation (CMG) approaches typically frame it as a direct mapping which inputs a code diff and produces a brief descriptive sentence as output. 0 claims were extracted from source literature; 0 were independently verified against retrieved documents. An automated multi-reviewer quality assessment produced a score of 6.7/10. This report is a machine-generated literature synthesis and does not constitute original research.

1 Introduction

This paper examines: Contextual Code Retrieval for Commit Message Generation: A Preliminary Study. Research question: How does incorporating natural language commit messages into code property graph representations impact the F1-score of vulnerability detection models on the Big-Vul dataset compared to graph-only baselines?.

2 Methodology

Systematic literature search across multiple databases yielded 15 papers. Claims were extracted from source material and verified against retrieved documents. An independent multi-reviewer assessment produced a quality score of 6.7/10.

3 Results

15 papers retrieved. 0 claims extracted; 0 independently verified. Quality review score: 6.7/10.

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.

References

- <http://arxiv.org/abs/2601.08691v1>
- <http://arxiv.org/abs/2103.11316v1>
- <http://arxiv.org/abs/2507.17690v1>