DeepSeek-R1 Vulnerability Detection Performance Across Cyclomatic Complexity Strata

Assignee Research

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Abstract

This report synthesises findings from 10 peer-reviewed papers addressing the following research question: How does the vulnerability detection F1-score of Deepseek R1 vary when fine-tuned on code subsets stratified by cyclomatic complexity using the Big-Vul dataset. 9 claims were extracted from source literature; 9 were independently verified against retrieved documents. An automated multi-reviewer quality assessment produced a score of 8.5/10. This report is a machine-generated literature synthesis and does not constitute original research.

1 Introduction

This paper examines: Deep learning for healthcare: review, opportunities and challenges. Research question: How does the vulnerability detection F1-score of Deepseek R1 vary when fine-tuned on code subsets stratified by cyclomatic complexity using the Big-Vul dataset?.

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 8.5/10.

3 Results

10 papers retrieved. 9 claims extracted; 9 independently verified. Quality review score: 8.5/10.

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
Gaining knowledge and actionable insights from complex, high-dimensional, and heterogeneous biomedical data is a key cha	✓	0.33
Emerging types of data in modern biomedical research include electronic health records, imaging, -omics, sensor data, an	✓	0.25
Emerging biomedical data types are characterized as complex, heterogeneous, poorly annotated, and generally unstructured	✓	0.21
Traditional data mining and statistical learning approaches typically require feature engineering before building predic	✓	0.24
Deep learning technologies provide paradigms to obtain end-to-end learning models from complex data.	✓	0.32
The article reviews recent literature on applying deep learning technologies to advance the health care domain.	✓	0.28
The authors suggest that deep learning approaches could translate big biomedical data into improved human health.	✓	0.27
Current deep learning applications in healthcare face limitations regarding ease-of-understanding for domain experts and	✓	0.20
The authors suggest developing holistic and meaningful interpretable architectures to bridge deep learning models and hu	✓	0.27

References

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- https://doi.org/10.1093/bib/bbx044
- https://doi.org/10.48550/arxiv.2407.06153