

What is the impact of using graph neural networks versus traditional machine learning classifiers on detection

Assignee Research

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Abstract

Abstract The growing importance of data security in modern information systems extends beyond the preventing malicious software and includes the critical topic of data privacy. Centralized data processing in traditional machine learning methods presents significant challenges, including greater risk of data breaches and attacks on centralized systems. This study addresses the critical issue of maintaining data privacy while obtaining effective malware detection and classification. The motivation stems from the growing requirement for robust and privacy-preserving machine learning methodologies

1 Introduction

This paper examines: FEDetect: A Federated Learning-Based Malware Detection and Classification Using Deep Neural Network Algorithms. Research question: What is the impact of using graph neural networks versus traditional machine learning classifiers on detection accuracy and false positive rates when evaluating obfuscated Android malware on the AndroZoo benchmark?.

2 Methodology

Systematic literature search across multiple databases yielded 14 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

14 papers retrieved. 2 claims extracted; 2 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
The CIC-MalMem-2022 dataset was used to build 22 models with feedforward neural networks and long short-term memory meth	✓	0.31
Federated learning performed with an accuracy of 0.999 in binary classification and 0.845 in multiclass classification.	✓	0.25

References

- <https://doi.org/10.1109/access.2021.3079370>
- <https://doi.org/10.1007/s13369-025-10043-x>
- <https://doi.org/10.1145/3371924>