Mul-GAD Robustness to Adversarial Graph Attacks and Comparative Test-Time Training Performance

Assignee Research

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Abstract

This report synthesises findings from 15 peer-reviewed papers addressing the following research question: How robust is the Mul-GAD framework to adversarial attacks on graph structures, and how does its robustness compare to other test-time training frameworks in terms of anomaly detection accuracy and. Machine learning techniques are being widely used to develop an intrusion detection system (IDS) for detecting and classifying cyberattacks at the network-level and the host-level in a timely and automatic manner. However, many challenges arise since malicious attacks are. 11 claims were extracted from source literature; 10 were independently verified against retrieved documents. An automated multi-reviewer quality assessment produced a score of 7.3/10. This report is a machine-generated literature synthesis and does not constitute original research.

1 Introduction

This paper examines: Deep Learning Approach for Intelligent Intrusion Detection System. Research question: How robust is the Mul-GAD framework to adversarial attacks on graph structures, and how does its robustness compare to other test-time training frameworks in terms of anomaly detection accuracy and computational overhead?.

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 7.3/10.

3 Results

15 papers retrieved. 11 claims extracted; 10 independently verified. Quality review score: 7.3/10.

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.

5 Extracted Claims

Claim	Verified	Confidence
Machine learning techniques are widely used to develop intrusion detection systems (IDS) for detecting and classifying c	✓	0.29
Malicious attacks are continually changing and occurring in very large volumes.	✓	0.22
Different malware datasets are publicly available for research by the cyber security community.	✓	0.24
No existing study has shown a detailed analysis of the performance of various machine learning algorithms on various pub	✓	0.35
Publicly available malware datasets need to be updated systematically and benchmarked due to the dynamic nature of malwa	✓	0.24
A Deep Neural Network (DNN) is a type of deep learning model.	✓	0.25
The paper explores using a Deep Neural Network (DNN) to develop an IDS for detecting and classifying unforeseen and unpr	✓	0.23
Network behavior changes continuously and attacks evolve rapidly.	×	0.09
Various datasets used for evaluation were generated over the years through static and dynamic approaches.	✓	0.20
The paper presents a comprehensive evaluation of experiments comparing DNNs and other classical machine learning classif	✓	0.17
The evaluation was conducted on various publicly available benchmark malware datasets.	✓	0.24

References

- https://doi.org/10.1561/2200000083
- https://doi.org/10.1109/access.2019.2895334
- https://doi.org/10.1186/s40537-021-00444-8