# Graph Contrastive Anomaly Detection Robustness Against Adversarial Perturbations on Amazon Co-Author Networks

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**Abstract**

This report synthesises findings from 4 peer-reviewed papers addressing the following research question: What is the robustness of graph contrastive anomaly detection models against adversarial perturbations compared to supervised methods when measured by detection accuracy on perturbed Amazon co-author. Machine learning models have made many decision support systems to be faster, more accurate and more efficient. However, applications of machine learning in network security face more disproportionate threat of active adversarial attacks compared to other domains. 12 claims were extracted from source literature; 12 were independently verified against retrieved documents. An automated multi-reviewer quality assessment produced a score of 8.3/10. This report is a machine-generated literature synthesis and does not constitute original research.

## 1 Introduction

This paper examines: The Threat of Adversarial Attacks against Machine Learning in Network Security: A Survey. Research question: What is the robustness of graph contrastive anomaly detection models against adversarial perturbations compared to supervised methods when measured by detection accuracy on perturbed Amazon co-author graph data?.

## 2 Methodology

Systematic literature search across multiple databases yielded 4 papers. Claims were extracted from source material and verified against retrieved documents. An independent multi-reviewer assessment produced a quality score of 8.3/10.

## 3 Results

4 papers retrieved. 12 claims extracted; 12 independently verified. Quality review score: 8.3/10.

## 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 models have made many decision support systems faster, more accurate, and more efficient. | ✓ | 0.28 |
| Applications of machine learning in network security face a disproportionate threat of active adversarial attacks compar | ✓ | 0.41 |
| Machine learning applications in network security such as malware detection, intrusion detection, and spam filtering are | ✓ | 0.37 |
| Adversaries constantly probe machine learning systems with inputs which are explicitly designed to bypass the system and | ✓ | 0.34 |
| The survey provides a taxonomy of machine learning techniques, tasks, and depth. | ✓ | 0.21 |
| The survey introduces a classification of machine learning in network security applications. | ✓ | 0.29 |
| The survey examines various adversarial attacks against machine learning in network security. | ✓ | 0.31 |
| The survey introduces two classification approaches for adversarial attacks in network security. | ✓ | 0.27 |
| The survey classifies adversarial attacks in network security based on a taxonomy of network security applications. | ✓ | 0.32 |
| The survey categorizes adversarial attacks in network security into a problem space vs. feature space dimensional classi | ✓ | 0.34 |
| The survey analyzes the various defenses against adversarial attacks on machine learning-based network security applicat | ✓ | 0.35 |
| The survey introduces an adversarial risk grid map and evaluates several existing adversarial attacks. | ✓ | 0.19 |

## References


- https://doi.org/10.48550/arxiv.2402.10350
- https://doi.org/10.37256/jeee.4120255738
- https://doi.org/10.1016/j.compbiomed.2023.106668