

Mul-GAD Computational Efficiency and Scalability in Large-Scale Graph Anomaly Detection

Assignee Research

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Abstract

This report synthesises findings from 12 peer-reviewed papers addressing the following research question: What is the computational efficiency and scalability of Mul-GAD compared to other state-of-the-art GNN-based anomaly detection models when applied to large-scale graph datasets like Reddit and Twitter. Anomaly detection is defined as discovering patterns that do not conform to the expected behavior. Previously, anomaly detection was mostly conducted using traditional shallow learning techniques, but with little improvement. 6 claims were extracted from source literature; 2 were independently verified against retrieved documents. An automated multi-reviewer quality assessment produced a score of 5.3/10. This report is a machine-generated literature synthesis and does not constitute original research.

1 Introduction

This paper examines: Mul-GAD: a semi-supervised graph anomaly detection framework via aggregating multi-view information. Research question: What is the computational efficiency and scalability of Mul-GAD compared to other state-of-the-art GNN-based anomaly detection models when applied to large-scale graph datasets like Reddit and Twitter?.

2 Methodology

Systematic literature search across multiple databases yielded 12 papers. Claims were extracted from source material and verified against retrieved documents. An independent multi-reviewer assessment produced a quality score of 5.3/10.

3 Results

12 papers retrieved. 6 claims extracted; 2 independently verified. Quality review score: 5.3/10.

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
The Mul-GAD approach outperforms the state-of-the-art not only on detection performance, but also in terms of generaliza	✓	0.17
Label-oriented objective functions have a more generalized performance compared to reconstruction-oriented and SSL-orien	×	0.03
Feature similarity matrix computation plays an important role in boosting detection performance.	×	0.04
The model shows better generalization by utilizing plentiful information from different views.	×	0.08
Fusion strategies at view and feature levels boost detection performance.	✓	0.17
The final model has a significant improvement on most datasets.	×	0.02

References

- <http://arxiv.org/abs/2212.05478v1>
- <http://arxiv.org/abs/2203.07969v1>
- <http://arxiv.org/abs/2205.15508v1>