

Multi-View Fusion Strategies in Mul-GAD for Graph Anomaly Detection Performance

Assignee Research

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Abstract

This report synthesises findings from 8 peer-reviewed papers addressing the following research question: What is the impact of multi-view fusion strategies (e.g., attention-based vs. concatenation-based) in the Mul-GAD framework on downstream task performance, as evaluated through both accuracy and. 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. 10 claims were extracted from source literature; 1 was independently verified against retrieved documents. An automated multi-reviewer quality assessment produced a score of 4.2/10. 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 impact of multi-view fusion strategies (e.g., attention-based vs. concatenation-based) in the Mul-GAD framework on downstream task performance, as evaluated through both accuracy and computational overhead on standardized graph anomaly detection benchmarks like PyGOD?.

2 Methodology

Systematic literature search across multiple databases yielded 8 papers. Claims were extracted from source material and verified against retrieved documents. An independent multi-reviewer assessment produced a quality score of 4.2/10.

3 Results

8 papers retrieved. 10 claims extracted; 1 independently verified. Quality review score: 4.2/10.

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 | × | 0.14 |
| Experiments show that computing the feature similarity matrix plays an important role in boosting the detection performa | × | 0.05 |
| The final model, which is equipped with a label-oriented objective function and fusion strategies, has a significant imp | × | 0.13 |
| Adequate experimental validation is the foundation for selecting the objective function. | × | 0.05 |
| The Mul-GAD approach uses learnable parameters to control the contribution of each view. | × | 0.07 |
| The Mul-GAD approach utilizes the feature similarity matrix to make full use of complementary information while avoiding | × | 0.11 |
| The Mul-GAD approach provides two effective fusion strategies at the view and feature level, both of which boost detecti | ✓ | 0.19 |
| The Mul-GAD approach is the first to analyze the anomaly detection problem from the perspective of objective functions a | × | 0.09 |
| Shallow learning methods, such as LOF and KNN, are constrained by inductive bias and are hard to spot abnormal nodes mas | × | 0.03 |
| Anomaly detection can be categorized into label-oriented, reconstruction-oriented, and SSL-oriented objective functions. | × | 0.05 |

References

- <http://arxiv.org/abs/2305.02496v1>
- <http://arxiv.org/abs/1404.4679v2>
- <http://arxiv.org/abs/2212.05478v1>