Contrastive Learning Outlier Detection Robustness in Graph Neural Networks Under Adversarial Noise

Assignee Research

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Abstract

This report synthesises findings from 9 peer-reviewed papers addressing the following research question: What is the robustness of contrastive learning-based outlier detection methods in graph neural networks to adversarial attacks or noisy attributes, and how does this compare to traditional anomaly. Anomaly detection on attributed networks attracts considerable research interests due to wide applications of attributed networks in modeling a wide range of complex systems. Recently, the deep learning-based anomaly detection methods have shown promising results over shallow. 11 claims were extracted from source literature; 0 were independently verified against retrieved documents. An automated multi-reviewer quality assessment produced a score of 3.2/10. This report is a machine-generated literature synthesis and does not constitute original research.

1 Introduction

This paper examines: Anomaly Detection on Attributed Networks via Contrastive Self-Supervised Learning. Research question: What is the robustness of contrastive learning-based outlier detection methods in graph neural networks to adversarial attacks or noisy attributes, and how does this compare to traditional anomaly detection benchmarks on attributed graphs?.

2 Methodology

Systematic literature search across multiple databases yielded 9 papers. Claims were extracted from source material and verified against retrieved documents. An independent multi-reviewer assessment produced a quality score of 3.2/10.

3 Results

9 papers retrieved. 11 claims extracted; 0 independently verified. Quality review score: 3.2/10.

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
SNE employs neural networks to model the interrelations between structure and attribute.	×	0.05
TriDNR jointly learns node embedding via tri-party information sources including node's structure, attributes and labels	×	0.06
NETTENTION leverages adversarial training mechanism and self-attention module to learn informative node embeddings.	×	0.08
GCN performs a localized first-order approximation of spectral graph convolutions to learn node representation efficient	×	0.03
GAT introduces the attention mechanism to aggregate neighbors' information with adaptive weights.	×	0.02
AMEN detects anomalies by leveraging ego-network information of each node on attributed networks.	×	0.09
Radar characterizes the residuals of attribute information and its coherence with network information for anomaly detect	×	0.08
ANOMALOUS jointly considers CUR decomposition and residual analysis for anomaly detection on attributed networks.	×	0.12
Zhu et al. present a joint learning model to detect mixed anomaly by core initiating and expanding.	×	0.06
The GNN module in the CoLA framework can be set to any type of the aforementioned GNNs.	×	0.06
The proposed CoLA uses GCN as the backbone of the GNN module.	×	0.03

References

- http://arxiv.org/abs/2103.00113v2
- http://arxiv.org/abs/2311.17853v2
- http://arxiv.org/abs/1404.4679v2