Contrastive Loss Functions in AmGCL and Their Impact on Anomaly Detection AUC-ROC

Assignee Research

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Abstract

This report synthesises findings from 9 peer-reviewed papers addressing the following research question: How does the choice of contrastive loss function in AmGCL affect the AUC-ROC for anomaly detection in graphs with varying percentages of missing node attributes. Attribute graphs are ubiquitous in multimedia applications, and graph representation learning (GRL) has been successful in analyzing attribute graph data. However, incomplete graph data and missing node attributes can have a negative impact on media knowledge discovery. 7 claims were extracted from source literature; 0 were independently verified against retrieved documents. An automated multi-reviewer quality assessment produced a score of 3.3/10. This report is a machine-generated literature synthesis and does not constitute original research.

1 Introduction

This paper examines: AmGCL: Feature Imputation of Attribute Missing Graph via Self-supervised Contrastive Learning. Research question: How does the choice of contrastive loss function in AmGCL affect the AUC-ROC for anomaly detection in graphs with varying percentages of missing node attributes?.

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 3.3/10.

3 Results

9 papers retrieved. 7 claims extracted; 0 independently verified. Quality review score: 3.3/10.

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 reconstruction loss employs Dirichlet energy minimisation to measure the difference between the reconstructed featur	×	0.08
The mean squared error (MSE) is used as the loss function between the online network and the reconstructor.	×	0.02
The comprehensive loss function is represented as L = Lrec + λLfcl, where λ is the hyperparameter that controls the weig	×	0.03
The Cora dataset is a widely used benchmark for evaluating the performance of graph-based machine learning algorithms.	×	0.09
The CiteSeer dataset is a digital library and search engine.	×	0.01
Graph neural network-based methods such as GCN and GAT allow for the direct inclusion of missing values during training	×	0.06
Recent research has explored using generative GNN-based learning, which assumes latent variables for missing attribute f	×	0.10

References

- http://arxiv.org/abs/2206.07869v1
- http://arxiv.org/abs/2305.03741v1
- http://arxiv.org/abs/1404.4679v2