

Contrastive Pre-Training Effects on Graph Neural Network Anomaly Detection Efficiency and Scalability

Assignee Research

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Abstract

This report synthesises findings from 12 peer-reviewed papers addressing the following research question: What is the impact of contrastive pre-training on the inference efficiency and scalability of graph neural network anomaly detectors compared to reconstruction-based methods on large-scale attributed. In graph-level representation learning tasks, graph neural networks have received much attention for their powerful feature learning capabilities. However, with the increasing scales of graph data, how to efficiently process and extract the key information has become the focus. 8 claims were extracted from source literature; 8 were independently verified against retrieved documents. An automated multi-reviewer quality assessment produced a score of 8.8/10. This report is a machine-generated literature synthesis and does not constitute original research.

1 Introduction

This paper examines: Graph pooling for graph-level representation learning: a survey. Research question: What is the impact of contrastive pre-training on the inference efficiency and scalability of graph neural network anomaly detectors compared to reconstruction-based methods on large-scale attributed graphs?.

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 8.8/10.

3 Results

12 papers retrieved. 8 claims extracted; 8 independently verified. Quality review score: 8.8/10.

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
Graph neural networks have received much attention for their powerful feature learning capabilities in graph-level repre	✓	0.37
The graph pooling technique simplifies the graph structure by merging nodes or subgraphs, which significantly improves t	✓	0.40
Various graph pooling methods have been proposed by numerous scholars, but there is still a relative lack of systematic	✓	0.35
The paper comprehensively sorts out the fundamentals and recent progress of graph pooling techniques in graph neural net	✓	0.30
The paper discusses the wide range of application scenarios of graph pooling, as well as the current challenges and oppo	✓	0.25
The paper provides a detailed introduction to the basics of graph pooling, including its definition, principles, and its	✓	0.35
The paper categorizes and summarizes the research preliminaries of graph pooling, including various graph pooling method	✓	0.32
The paper explores the potential of graph pooling for a wide range of applications, providing insightful insights for th	✓	0.31

References

- <https://doi.org/10.1007/s10462-025-11287-7>
- <https://doi.org/10.1007/s10462-024-10949-2>
- <https://doi.org/10.1007/s10462-025-11223-9>