

# Multi-View Aggregation Efficiency in Mul-GAD for Large-Scale Heterophilic Graphs

Assignee Research

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## Abstract

This report synthesises findings from 11 peer-reviewed papers addressing the following research question: What is the computational efficiency trade-off of Mul-GAD's multi-view aggregation mechanism compared to single-view GNN-based anomaly detection methods when scaling to large heterophilic graphs. Recent years have witnessed fast developments of graph neural networks (GNNs) that have benefited myriad graph analytic tasks and applications. Most GNNs rely on the homophily assumption that nodes belonging to the same class are more likely to be connected. 5 claims were extracted from source literature; 5 were independently verified against retrieved documents. An automated multi-reviewer quality assessment produced a score of 8.5/10. This report is a machine-generated literature synthesis and does not constitute original research.

## 1 Introduction

This paper examines: Graph Neural Networks for Graphs With Heterophily: A Survey. Research question: What is the computational efficiency trade-off of Mul-GAD's multi-view aggregation mechanism compared to single-view GNN-based anomaly detection methods when scaling to large heterophilic graphs?.

## 2 Methodology

Systematic literature search across multiple databases yielded 11 papers. Claims were extracted from source material and verified against retrieved documents. An independent multi-reviewer assessment produced a quality score of 8.5/10.

### 3 Results

11 papers retrieved. 5 claims extracted; 5 independently verified. Quality review score: 8.5/10.

### 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
Most Graph Neural Networks (GNNs) rely on the homophily assumption that nodes belonging to the same class are more likely	✓	0.27
Heterophily is defined as a graph property where nodes with different labels tend to be linked.	✓	0.17
Heterophily significantly limits the performance of tailor-made homophilic GNNs.	✓	0.20
Heterophily is a ubiquitous graph property in numerous real-world scenarios.	✓	0.20
The paper proposes a systematic taxonomy that governs existing heterophilic GNN models.	✓	0.19

### References

- <https://doi.org/10.1609/aaai.v37i4.25573>
- <https://doi.org/10.48550/arxiv.2407.09618>
- <https://doi.org/10.1109/tkde.2026.3680353>