

LightGCL, SGL, and GCA Sample Efficiency in Low-Data Recommendation Benchmarks

Assignee Research

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Abstract

This report synthesises findings from 10 peer-reviewed papers addressing the following research question: How does the sample efficiency of LightGCL compare to SGL and GCA in low-data regimes on MovieLens and Amazon recommendation benchmarks. Graph neural network (GNN) is a powerful learning approach for graph-based recommender systems. Recently, GNNs integrated with contrastive learning have shown superior performance in recommendation with their data augmentation schemes, aiming at dealing with highly sparse data. 13 claims were extracted from source literature; 0 were independently verified against retrieved documents. An automated multi-reviewer quality assessment produced a score of 3.0/10. This report is a machine-generated literature synthesis and does not constitute original research.

1 Introduction

This paper examines: LightGCL: Simple Yet Effective Graph Contrastive Learning for Recommendation. Research question: How does the sample efficiency of LightGCL compare to SGL and GCA in low-data regimes on MovieLens and Amazon recommendation benchmarks?.

2 Methodology

Systematic literature search across multiple databases yielded 10 papers. Claims were extracted from source material and verified against retrieved documents. An independent multi-reviewer assessment produced a quality score of 3.0/10.

3 Results

10 papers retrieved. 13 claims extracted; 0 independently verified. Quality review score: 3.0/10.

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
LightGCL achieves a Recall@20 of 0.0793 and NDCG@20 of 0.0668 on the Yelp dataset.	×	0.01
LightGCL achieves a Recall@40 of 0.1292 and NDCG@40 of 0.0852 on the Yelp dataset.	×	0.01
LightGCL achieves a Recall@20 of 0.1578 and NDCG@20 of 0.0935 on the Gowalla dataset.	×	0.01
LightGCL achieves a Recall@40 of 0.2245 and NDCG@40 of 0.1108 on the Gowalla dataset.	×	0.01
LightGCL achieves a Recall@20 of 0.2107 and NDCG@20 of 0.2476 on the ML-10M dataset.	×	0.01
LightGCL achieves a Recall@20 of 0.0985 and NDCG@20 of 0.0842 on the Yelp dataset when compared to SimGCL.	×	0.01
LightGCL achieves a Recall@40 of 0.1553 and NDCG@40 of 0.1051 on the Yelp dataset when compared to SimGCL.	×	0.01
LightGCL achieves a Recall@20 of 0.2148 and NDCG@20 of 0.1250 on the Gowalla dataset when compared to SimGCL.	×	0.01
LightGCL achieves a Recall@40 of 0.2995 and NDCG@40 of 0.1468 on the Gowalla dataset when compared to SimGCL.	×	0.01
LightGCL achieves a Recall@20 of 0.1161 and NDCG@20 of 0.0901 on the Amazon dataset when compared to SimGCL.	×	0.04
LightGCL achieves a Recall@40 of 0.1705 and NDCG@40 of 0.1080 on the Amazon dataset when compared to SimGCL.	×	0.04
LightGCL achieves a Recall@20 of 0.0884 and NDCG@20 of 0.0629 on the Tmall dataset when compared to SimGCL.	×	0.01
LightGCL achieves a Recall@40 of 0.1337 and NDCG@40 of 0.0786 on the Tmall dataset when compared to SimGCL.	×	0.01

References

- <http://arxiv.org/abs/2302.08191v3>
- <http://arxiv.org/abs/2506.00048v1>

- <http://arxiv.org/abs/2504.01863v2>