Edge-Level Ego-Network Encodings Improve GNN Robustness Against Adversarial Edge Perturbations

Assignee Research

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Abstract

This report synthesises findings from 13 peer-reviewed papers addressing the following research question: To what extent do edge-level ego-network encodings enhance the robustness of Graph Neural Networks against adversarial edge perturbations measured by accuracy degradation curves on noisy graph. 9 claims were extracted from source literature; 9 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: Embedding Entities and Relations for Learning and Inference in Knowledge Bases. Research question: To what extent do edge-level ego-network encodings enhance the robustness of Graph Neural Networks against adversarial edge perturbations measured by accuracy degradation curves on noisy graph classification benchmarks?.

2 Methodology

Systematic literature search across multiple databases yielded 13 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

13 papers retrieved. 9 claims extracted; 9 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
Logic rules express explicit knowledge and can provide human-understandable explanations for reasoning processes.	✓	0.35
Logic rules have found wide application in knowledge graphs and other downstream tasks.	✓	0.30
Extracting rules manually from large knowledge graphs is labour-intensive and often infeasible.	✓	0.32
Automated rule learning has recently attracted significant interest.	✓	0.25
A number of approaches to rule learning for knowledge graphs have been proposed.	✓	0.34
This survey provides a review of approaches and a classification of state-of-the-art systems for learning first-order lo	✓	0.35
A comparative analysis of various approaches to rule learning is conducted based on rule language biases, underlying met	✓	0.40
The approaches considered include inductive logic programming (ILP)-based, statistical path generalisation, and neuro-sy	✓	0.33
Important and promising application scenarios of rule learning include rule-based knowledge graph completion, fact check	✓	0.37

References

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- https://doi.org/10.1109/access.2023.3275789
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