GCN Integration in Multimodal Models Enhances Robustness to Diffusion Attacks

Assignee Research

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Abstract

This report synthesises findings from 14 peer-reviewed papers addressing the following research question: How does the integration of Graph Convolutional Networks (GCNs) in multimodal models affect their robustness against iterative diffusion attacks in language and vision tasks, as measured by accuracy. 10 claims were extracted from source literature; 0 were independently verified against retrieved documents. An automated multi-reviewer quality assessment produced a score of 3.2/10. This report is a machine-generated literature synthesis and does not constitute original research.

1 Introduction

This paper examines: Adversarial Diffusion Attacks on Graph-based Traffic Prediction Models. Research question: How does the integration of Graph Convolutional Networks (GCNs) in multimodal models affect their robustness against iterative diffusion attacks in language and vision tasks, as measured by accuracy degradation on benchmarks like VCR and VQA?.

2 Methodology

Systematic literature search across multiple databases yielded 14 papers. Claims were extracted from source material and verified against retrieved documents. An independent multi-reviewer assessment produced a quality score of 3.2/10.

3 Results

14 papers retrieved. 10 claims extracted; 0 independently verified. Quality review score: 3.2/10.

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
Szegedy et al. (2013) discovered that adversarial samples are low-probability but densely distributed in deep neural net	×	0.05
Goodfellow et al. showed that neural networks are vulnerable to adversarial samples when DNNs demonstrate linear behavio	×	0.04
An experiment involving 99 smartphones moving slowly on a handcart caused Google Maps to identify an empty street as a c	×	0.00
Mobile phone-based mapping services such as Google Maps and AutoNavi make traffic state estimation and prediction based	×	0.05
Traffic data is closely associated with the topological structure of road networks and is represented in non-Euclidean s	×	0.03
Conventional machine learning methods like multi-layer perceptrons overlook the graph-based inter-relationship in traffi	×	0.09
Traffic prediction tasks include traffic state prediction, demand prediction, and trajectory prediction.	×	0.11
Traffic state prediction includes the prediction of traffic flow, speed, and travel time.	×	0.07
Traffic demand prediction aims to predict the number of users and traffic demand, such as taxi requests, subway inflow/o	×	0.04
Trajectory prediction of travelers and vehicles is used for dynamic positioning and resource allocation.	×	0.03

References

- http://arxiv.org/abs/2403.10883v2
- http://arxiv.org/abs/2412.05830v1
- http://arxiv.org/abs/2104.09369v1