Federated Graph Learning Robustness with Prototype-Based Embeddings under Non-IID Data

Assignee Research

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Abstract

This report synthesises findings from 6 peer-reviewed papers addressing the following research question: How does the robustness of federated graph learning models with prototype-based embeddings compare to traditional embeddings under non-IID data distributions, measured by accuracy degradation and. Abstract The amount of data generated owing to the rapid development of the Smart Internet of Things is increasing exponentially. Traditional machine learning can no longer meet the requirements for training complex models with large amounts of data. 8 claims were extracted from source literature; 8 were independently verified against retrieved documents. An automated multi-reviewer quality assessment produced a score of 7.6/10. This report is a machine-generated literature synthesis and does not constitute original research.

1 Introduction

This paper examines: Survey: federated learning data security and privacy-preserving in edge-Internet of Things. Research question: How does the robustness of federated graph learning models with prototype-based embeddings compare to traditional embeddings under non-IID data distributions, measured by accuracy degradation and training instability on synthetic non-IID partitions of the PPI and PubMed datasets?.

2 Methodology

Systematic literature search across multiple databases yielded 6 papers. Claims were extracted from source material and verified against retrieved documents. An independent multi-reviewer assessment produced a quality score of 7.6/10.

3 Results

6 papers retrieved. 8 claims extracted; 8 independently verified. Quality review score: 7.6/10.

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
The amount of data generated owing to the rapid development of the Smart Internet of Things is increasing exponentially.	✓	0.30
Traditional machine learning can no longer meet the requirements for training complex models with large amounts of data.	✓	0.29
Federated learning, as a new paradigm for training statistical models in distributed edge networks, alleviates integrati	✓	0.44
Edge computing processes data at the edge layers of data sources to ensure low-data-delay processing; it provides high-b	✓	0.48
A combination of edge computing and federated learning can further optimize computing, communication, and data security	✓	0.40
This review investigated the development status of federated learning and expounded on its basic principles.	✓	0.28
Relevant work was investigated from cryptographic technologies (such as secure multi-party computation, homomorphic encr	✓	0.43
Challenges and future research directions for the integration of edge computing were discussed.	✓	0.20

References

- https://doi.org/10.1007/s10462-024-10774-7
- https://doi.org/10.3390/electronics14132512
- https://doi.org/10.1145/3589639