

# Metapath Context Convolutions vs. Standard Message-Passing in Large-Scale Heterogeneous Graph Neural Networks

Assignee Research

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## Abstract

This report synthesises findings from 10 peer-reviewed papers addressing the following research question: What is the efficiency trade-off in terms of inference time and memory usage between standard message-passing HGNNs and HGNNs with metapath context convolution on large-scale graph-structured code. Since real-world objects and their interactions are often multi-modal and multi-typed, heterogeneous networks have been widely used as a more powerful, realistic, and generic superclass of traditional homogeneous networks (graphs). Meanwhile, representation learning ( < i> 5 claims were extracted from source literature; 5 were independently verified against retrieved documents. An automated multi-reviewer quality assessment produced a score of 7.5/10. This report is a machine-generated literature synthesis and does not constitute original research.

## 1 Introduction

This paper examines: Heterogeneous Network Representation Learning: A Unified Framework With Survey and Benchmark. Research question: What is the efficiency trade-off in terms of inference time and memory usage between standard message-passing HGNNs and HGNNs with metapath context convolution on large-scale graph-structured code datasets?.

## 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 7.5/10.

### 3 Results

10 papers retrieved. 5 claims extracted; 5 independently verified. Quality review score: 7.5/10.

### 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
Heterogeneous networks have been widely used as a more powerful, realistic, and generic superclass of traditional homoge	✓	0.26
Representation learning (a.k.a. embedding) has recently been intensively studied and shown effective for various network	✓	0.28
There has already been a broad body of HNE algorithms.	✓	0.19
Existing HNE algorithms, though mostly claimed generic, are often evaluated on different datasets.	✓	0.27
The article creates four benchmark datasets with various properties regarding scale, structure, attribute/label.	✓	0.18

### References

- <https://doi.org/10.1109/tkde.2020.3045924>
- <https://doi.org/10.1609/aaai.v37i8.26192>
- <https://doi.org/10.1145/3568022>