Tree of Reviews vs. Chain-Based Retrieval: Latency and Throughput at Scale with Llama-3-8B-128K

Assignee Research

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Abstract

This report synthesises findings from 9 peer-reviewed papers addressing the following research question: How does the Tree of Reviews retrieval framework compare to chain-based retrieval in terms of latency and throughput when scaling to SQuAD variants with 100K+ documents using Llama-3-8B-128K. Multi-hop question answering is a knowledge-intensive complex problem. Large Language Models (LLMs) use their Chain of Thoughts (CoT) capability to reason complex problems step by step, and retrieval-augmentation can effectively alleviate factual errors caused by outdated and. 7 claims were extracted from source literature; 4 were independently verified against retrieved documents. An automated multi-reviewer quality assessment produced a score of 6.9/10. This report is a machine-generated literature synthesis and does not constitute original research.

1 Introduction

This paper examines: Tree of Reviews: A Tree-based Dynamic Iterative Retrieval Framework for Multi-hop Question Answering. Research question: How does the Tree of Reviews retrieval framework compare to chain-based retrieval in terms of latency and throughput when scaling to SQuAD variants with 100K+ documents using Llama-3-8B-128K?.

2 Methodology

Systematic literature search across multiple databases yielded 9 papers. Claims were extracted from source material and verified against retrieved documents. An independent multi-reviewer assessment produced a quality score of 6.9/10.

3 Results

9 papers retrieved. 7 claims extracted; 4 independently verified. Quality review score: 6.9/10.

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
TOR achieves state-of-the-art performance in both retrieval and response generation on three different multi-hop questio	✓	0.34
Tree of Thought (ToT) enhances the problem-solving capabilities of Large Language Models (LLMs) by introducing a tree-li	×	0.09
Tree of Reviews (TOR) is the first retrieval framework that uses a tree-like structure to dynamically initiate requests	✓	0.18
TOR introduces a tree structure to handle each retrieved paragraph separately, alleviating the misleading effect of irre	✓	0.31
The diversity of reasoning path extension in TOR reduces the impact of a single reasoning error on the whole.	✓	0.23
TOR proposes two tree-based search optimization strategies: pruning and effective expansion.	×	0.05
Pruning and effective expansion strategies in TOR demonstrate significant improvements in reducing time overhead and inc	×	0.04

References

- http://arxiv.org/abs/1811.08772v1
- http://arxiv.org/abs/2404.14464v1

- http://arxiv.org/abs/2507.23334v2