

# FlowKV Outperforms RoPE and DynamicRoPE in Long-Context Retrieval Accuracy and Latency

Assignee Research

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## Abstract

This report synthesises findings from 10 peer-reviewed papers addressing the following research question: How does FlowKV's performance on the MLNeedle benchmark compare to other long-context retrieval methods like RoPE or DynamicRoPE when applied to Llama-3-8B and Llama-3-70B at context lengths of 200K+. 12 claims were extracted from source literature; 7 were independently verified against retrieved documents. An automated multi-reviewer quality assessment produced a score of 7.2/10. This report is a machine-generated literature synthesis and does not constitute original research.

## 1 Introduction

This paper examines: Real-Time Damage Detection in Fiber Lifting Ropes Using Lightweight Convolutional Neural Networks. Research question: How does FlowKV's performance on the MLNeedle benchmark compare to other long-context retrieval methods like RoPE or DynamicRoPE when applied to Llama-3-8B and Llama-3-70B at context lengths of 200K+ tokens, measured by retrieval accuracy and latency?.

## 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 7.2/10.

## 3 Results

10 papers retrieved. 12 claims extracted; 7 independently verified. Quality review score: 7.2/10.

## 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
The proposed model achieves 96.5% accuracy, 94.8% precision, 98.3% recall, 96.5% F1-score, and 99.3% AUC.	✓	0.25
The model demonstrates real-time operation, low memory footprint, robustness to various environmental and operational conditions.	✓	0.35
The work was funded by Konecranes Plc as part of Business Finland and DIMECC Intelligent Industrial Data Program.	×	0.02
Lifting heavy payloads is a major health and safety hazard in many environments related to transportation.	×	0.05
Manual inspection procedures are labor intensive, time-consuming, subjective, and often require halting the production process.	×	0.06
The proposed system is a visual real-time damage detection system for synthetic fiber lifting ropes based on deep learning.	✓	0.29
The main contributions of this paper include creating an imaging apparatus that photographs crane ropes for visual damage detection.	✓	0.18
The imaging apparatus captures the progressive wear-and-tear as well as the more significant degradation in the rope's health.	✓	0.19
Experts from Konecranes annotate the collected images in accordance with the rope's condition; normal or damaged.	✓	0.26
The proposed model is evaluated for its detection and prediction performance, computational complexity, and compared with baseline methods.	✓	0.16
Deep learning tools yield discriminatory features without predisposition to the standard markings and can accommodate a wide range of rope types.	×	0.07
Deep learning techniques are more suited to detect damage in safety-critical applications.	×	0.09

## References

- <http://arxiv.org/abs/2302.11947v2>

- <http://arxiv.org/abs/2406.15019v1>
- <http://arxiv.org/abs/2603.03306v1>