Curriculum-Based Multi-Task Learning Throughput in Sparse Medical Image-Text Models

Assignee Research

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Abstract

This report synthesises findings from 11 peer-reviewed papers addressing the following research question: How does the inference throughput of curriculum-based multi-task learning compare to single-task learning on sparse medical image-text pairs when evaluated using the CHEST-i7 benchmark for multimodal. 10 claims were extracted from source literature; 10 were independently verified against retrieved documents. An automated multi-reviewer quality assessment produced a score of 8.0/10. This report is a machine-generated literature synthesis and does not constitute original research.

1 Introduction

This paper examines: Kolmogorov-Arnold Networks: A Critical Assessment of Claims, Performance, and Practical Viability. Research question: How does the inference throughput of curriculum-based multi-task learning compare to single-task learning on sparse medical image-text pairs when evaluated using the CHEST-i7 benchmark for multimodal models?.

2 Methodology

Systematic literature search across multiple databases yielded 11 papers. Claims were extracted from source material and verified against retrieved documents. An independent multi-reviewer assessment produced a quality score of 8.0/10.

3 Results

11 papers retrieved. 10 claims extracted; 10 independently verified. Quality review score: 8.0/10.

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
Kolmogorov-Arnold Networks (KANs) have gained significant attention as an alternative to traditional multilayer perceptr	✓	0.32
Proponents claim superior interpretability and performance through learnable univariate activation functions.	✓	0.21
Recent systematic evaluations reveal substantial discrepancies between theoretical claims and empirical evidence.	✓	0.28
KANs outperform MLPs only in symbolic regression tasks.	✓	0.20
KANs consistently underperform in machine learning, computer vision, and natural language processing benchmarks.	✓	0.20
The claimed advantages largely stem from B-spline activation functions rather than architectural innovations.	✓	0.26
Computational overhead (1.36-100x slower) severely limits practical deployment.	✓	0.25
Theoretical claims about breaking the 'curse of dimensionality' lack rigorous mathematical foundation.	✓	0.26
This work provides researchers and practitioners with evidence-based guidance for the rational adoption of KANs.	✓	0.26
This work highlights critical research gaps that must be addressed for broader applicability.	✓	0.19

References

- https://doi.org/10.48550/arxiv.2407.11075

- https://doi.org/10.1038/s41598-025-97256-0
- https://doi.org/10.1038/s41598-025-96527-0