Scaling Multimodal Models for Complex Diagram Interpretation and Inference Latency Trade-offs

Assignee Research

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Abstract

This report synthesises findings from 14 peer-reviewed papers addressing the following research question: What is the inference latency trade-off when scaling multimodal models to handle complex diagram interpretations in HumanEval-V tasks with increasing diagram complexity. 9 claims were extracted from source literature; 9 were independently verified against retrieved documents. An automated multi-reviewer quality assessment produced a score of 8.8/10. This report is a machine-generated literature synthesis and does not constitute original research.

1 Introduction

This paper examines: Gradient-based learning applied to document recognition. Research question: What is the inference latency trade-off when scaling multimodal models to handle complex diagram interpretations in HumanEval-V tasks with increasing diagram complexity?.

2 Methodology

Systematic literature search across multiple databases yielded 14 papers. Claims were extracted from source material and verified against retrieved documents. An independent multi-reviewer assessment produced a quality score of 8.8/10.

3 Results

14 papers retrieved. 9 claims extracted; 9 independently verified. Quality review score: 8.8/10.

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
Multilayer neural networks trained with the back-propagation algorithm constitute the best example of a successful gradi	✓	0.36
Given an appropriate network architecture, gradient-based learning algorithms can be used to synthesize a complex decisi	✓	0.41
Convolutional neural networks, which are specifically designed to deal with the variability of 2D shapes, are shown to o	✓	0.34
Real-life document recognition systems are composed of multiple modules including field extraction, segmentation recogni	✓	0.34
A new learning paradigm, called graph transformer networks (GTN), allows such multimodule systems to be trained globally	✓	0.43
Two systems for online handwriting recognition are described in the paper.	✓	0.21
Experiments demonstrate the advantage of global training and the flexibility of graph transformer networks.	✓	0.30
A graph transformer network for reading a bank cheque is described, which uses convolutional neural network character re	✓	0.45
The graph transformer network for reading a bank cheque is deployed commercially and reads several million cheques.	✓	0.27

References

- https://doi.org/10.48550/arxiv.2403.05530
- https://doi.org/10.1109/5.726791

- https://doi.org/10.1186/s40537-021-00444-8