

Fine-Tuning MMC-Instruction LMMs on Domain-Specific Charts Enhances ChartQA Performance

Assignee Research

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Abstract

This report synthesises findings from 12 peer-reviewed papers addressing the following research question: How does fine-tuning MMC-Instruction-trained LMMs on domain-specific chart datasets improve their performance on benchmarks like ChartQA, as compared to zero-shot capabilities. 12 claims were extracted from source literature; 2 were independently verified against retrieved documents. An automated multi-reviewer quality assessment produced a score of 4.5/10. This report is a machine-generated literature synthesis and does not constitute original research.

1 Introduction

This paper examines: MMC: Advancing Multimodal Chart Understanding with Large-scale Instruction Tuning. Research question: How does fine-tuning MMC-Instruction-trained LMMs on domain-specific chart datasets improve their performance on benchmarks like ChartQA, as compared to zero-shot capabilities?.

2 Methodology

Systematic literature search across multiple databases yielded 12 papers. Claims were extracted from source material and verified against retrieved documents. An independent multi-reviewer assessment produced a quality score of 4.5/10.

3 Results

12 papers retrieved. 12 claims extracted; 2 independently verified. Quality review score: 4.5/10.

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
MMC-Benchmark is a human-annotated benchmark containing nine distinct tasks for evaluating reasoning capabilities over c	✓	0.24
Existing Large Multimodal Models (LMMs), including GPT-4V, show limitations in correctly interpreting charts when evalua	✓	0.23
GPT-4V faces significant challenges on MMC-Benchmark, specifically in Chart to Datatable and Chart to Json tasks.	×	0.11
The MMC-Instruction dataset contains 600k samples, making it larger than FigureQA (180k), DVQA (300k), PlotQA (224k), Ch	×	0.05
MMC-Instruction supports free-form answers and open-ended/MQA formats, whereas FigureQA, DVQA, and PlotQA are limited to	×	0.03
MMCA achieves state-of-the-art performance on current chart question-answer benchmarks compared with existing open-sourc	×	0.11
On the ChartQA benchmark, MMCA achieves a score of 57.4, outperforming the variant without fine-tuned vision encoder whi	×	0.05
On the DocVQA benchmark, MMCA achieves a score of 72.5, outperforming the variant without fine-tuned vision encoder whic	×	0.03
On the TextVQA benchmark, MMCA achieves a score of 59.6, outperforming the variant without fine-tuned vision encoder whi	×	0.03
Fine-tuning the vision encoder part of the MMCA model results in better performance compared to not fine-tuning it.	×	0.09
In a specific test case regarding land area, GPT-4V and LLaVA-v1.5 incorrectly identified China as the third largest cou	×	0.03
MMC-Benchmark includes tasks such as chart information extraction, chart reasoning, contextual chart understanding, char	×	0.13

References

- <http://arxiv.org/abs/2311.10774v2>

- <http://arxiv.org/abs/2304.07995v1>
- <http://arxiv.org/abs/2508.04848v1>