Instruction-Tuning Dataset Diversity and Code Generation Performance in Qwen2.5-7B, Llama-2-7B, and Mistral-7B

Assignee Research

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Abstract

This report synthesises findings from 8 peer-reviewed papers addressing the following research question: What is the impact of instruction-tuning dataset diversity on the performance of Qwen2.5-7B, Llama-2-7B, and Mistral-7B in code generation tasks across HumanEval and MBPP benchmarks. 10 claims were extracted from source literature; 1 was 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: Vision-Flan: Scaling Human-Labeled Tasks in Visual Instruction Tuning. Research question: What is the impact of instruction-tuning dataset diversity on the performance of Qwen2.5-7B, Llama-2-7B, and Mistral-7B in code generation tasks across HumanEval and MBPP benchmarks?.

2 Methodology

Systematic literature search across multiple databases yielded 8 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

8 papers retrieved. 10 claims extracted; 1 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
VISION-FLAN BASE achieves state-of-the-art performance on MME, MM-Bench, and MMMU benchmarks.	×	0.10
VISION-FLAN BASE reduces hallucination and catastrophic forgetting.	×	0.12
VISION-FLAN BASE scores significantly lower on the LLaVA-Bench dataset compared to VLMs trained using GPT-4 synthesized	×	0.14
VISION-FLAN CHAT achieves significant performance improvement on LLaVA-Bench through second-stage tuning on 1,000 GPT-4	✓	0.19
Replacing instruction-tuned MLPs in VISION-FLAN BASE and VISION-FLAN CHAT with pretrained MLPs retains more than 90% of	×	0.07
The Pearson Correlation Coefficient between the parameters of pretrained MLPs and instruction-tuned MLPs is computed.	×	0.03
VISION-FLAN dataset contains 1.6M instances and 196 tasks.	×	0.06
VISION-FLAN dataset is based on publicly available datasets.	×	0.10
MultiInstruct dataset contains 510K instances and 62 tasks.	×	0.02
MultiInstruct dataset mainly focuses on visual grounding tasks and contains 29 tasks that do not involve region-specific	×	0.04

References

- http://arxiv.org/abs/2410.12381v3
- http://arxiv.org/abs/2402.11690v1

- http://arxiv.org/abs/2412.21199v2