

Fine-Tuned vs Zero-Shot Mistral-7B Performance on HumanEval-V Coding Tasks

Assignee Research

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Abstract

This report synthesises findings from 11 peer-reviewed papers addressing the following research question: What is the performance gap between fine-tuned and zero-shot Mistral-7B models on HumanEval-V, and how does it vary across different diagram-based task types. 15 claims were extracted from source literature; 1 was independently verified against retrieved documents. An automated multi-reviewer quality assessment produced a score of 4.8/10. This report is a machine-generated literature synthesis and does not constitute original research.

1 Introduction

This paper examines: HumanEval-V: Benchmarking High-Level Visual Reasoning with Complex Diagrams in Coding Tasks. Research question: What is the performance gap between fine-tuned and zero-shot Mistral-7B models on HumanEval-V, and how does it vary across different diagram-based task types?.

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 4.8/10.

3 Results

11 papers retrieved. 15 claims extracted; 1 independently verified. Quality review score: 4.8/10.

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
HumanEval-V consists of 253 human-annotated coding tasks.	✓	0.16
Each task in HumanEval-V features a diagram, a function signature, and test cases.	×	0.12
HumanEval-V diagrams span six task types.	×	0.12
HumanEval-V uses code generation tasks for evaluation instead of multiple-choice or short-answer questions.	×	0.08
Claude 3.5 Sonnet achieves a 36.8% pass@1 score on HumanEval-V.	×	0.10
Pixtral 124B achieves a 21.3% pass@1 score on HumanEval-V.	×	0.03
Claude 3.5 Sonnet achieves a 74.3% pass rate with 100 samples.	×	0.04
Claude 3.5 Sonnet reaches a 55.3% pass@1 rate with four self-refining iterations based on test case execution feedback.	×	0.04
Experiments were conducted with 22 LMMs.	×	0.11
The evaluation pipeline includes a variant denoted as PV2C(D, σ) which maps diagram D and function signature σ to code.	×	0.05
The Chain of Thought (CoT) variant incorporates a zero-shot CoT instruction prompting the model to outline reasoning before	×	0.07
The Intermediate Textual Representation variant produces a structured textual problem specification consisting of Problem	×	0.04
GPT-4o achieved a 27.7% score in one configuration and 40.0% in another configuration listed in the benchmark table.	×	0.05
Gemini 1.5 Pro achieved a 22.9% score in one configuration and 34.1% in another configuration listed in the benchmark table.	×	0.03
Pixtral 124B is an open-weight LMM with more than 70B parameters.	×	0.02

References

- <http://arxiv.org/abs/2603.21389v1>

- <http://arxiv.org/abs/2410.12381v3>
- <http://arxiv.org/abs/2508.11281v3>