

# Symbolic Reasoning Modules Enhance Multimodal Model Accuracy on High-Diagram-Complexity Tasks

Assignee Research

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## Abstract

This report synthesises findings from 10 peer-reviewed papers addressing the following research question: How does integrating explicit symbolic reasoning modules affect the pass@1 accuracy of multimodal models on HumanEval-V tasks categorized by high diagram complexity. 11 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: HumanEval-V: Benchmarking High-Level Visual Reasoning with Complex Diagrams in Coding Tasks. Research question: How does integrating explicit symbolic reasoning modules affect the pass@1 accuracy of multimodal models on HumanEval-V tasks categorized by high diagram complexity?.

## 2 Methodology

Systematic literature search across multiple databases yielded 10 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

10 papers retrieved. 11 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
HumanEval-V consists of 253 human-annotated coding tasks.	✓	0.18
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
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.	×	0.03
Claude 3.5 Sonnet reaches a 55.3% pass@1 score with four self-refining iterations based on test case execution feedback.	×	0.03
Experiments were conducted with 22 Large Multimodal Models (LMMs).	×	0.15
GPT-4o achieved a 27.7% pass@1 score in the baseline evaluation.	×	0.04
Gemini 1.5 Pro achieved a 22.9% pass@1 score in the baseline evaluation.	×	0.03
The evaluation pipeline includes a variant where the model generates a structured textual problem specification consisti	×	0.04

## References

- <http://arxiv.org/abs/2601.01982v1>
- <http://arxiv.org/abs/2410.12381v3>
- <http://arxiv.org/abs/2209.08750v1>