PaLM-E Robustness to Sensor Noise in Long-Horizon Multimodal Navigation Tasks

Assignee Research

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Abstract

This report synthesises findings from 8 peer-reviewed papers addressing the following research question: How does the robustness of PaLM-E to sensor noise in multimodal inputs affect its performance metrics on long-horizon navigation tasks within the ALFRED benchmark. 17 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: Towards Long-Horizon Vision-Language Navigation: Platform, Benchmark and Method. Research question: How does the robustness of PaLM-E to sensor noise in multimodal inputs affect its performance metrics on long-horizon navigation tasks within the ALFRED benchmark?.

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. 17 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
The LHPR-VLN benchmark consists of 3,260 tasks with an average of 150 task steps.	✓	0.16
The average instruction length for LHPR-VLN is 18.17.	×	0.02
The average task steps for LHPR-VLN is 150.95.	×	0.08
The LHPR-VLN benchmark uses the Habitat simulator.	×	0.06
The LHPR-VLN benchmark involves 216 scenes.	×	0.03
The LHPR-VLN benchmark includes multi-stage VLN tasks.	×	0.10
The LHPR-VLN benchmark uses GPT-4 to generate instruction lists.	×	0.02
The LHPR-VLN benchmark uses an expert model or a well-trained navigation model to guide the agent.	×	0.06
The LHPR-VLN benchmark uses a trajectory decomposition algorithm to split complex task trajectories into multiple single	×	0.11
The LHPR-VLN benchmark uses a dynamic sliding window to search for the longest continuous action segments within the tra	×	0.03
The LHPR-VLN benchmark uses the RAM image annotation model to provide high-confidence visual annotations.	×	0.03
The LHPR-VLN benchmark uses GPT-4 to generate VLN tasks for step-by-step guidance.	×	0.05
The LHPR-VLN benchmark defines a complex task that includes multiple single-stage subtasks.	×	0.10
The LHPR-VLN benchmark involves locating an object at a specified initial location and moving it to a target location.	×	0.01
The LHPR-VLN benchmark includes tasks for Spot and Stretch robot types, accounting for 50.5% and 49.5% respectively.	×	0.02
The LHPR-VLN benchmark uses a navigation model based on the chain-of-thought (CoT) feedback and adaptive memory design.	×	0.09
The LHPR-VLN benchmark uses CoT prompts and dynamic long-term and short-term memories for efficient navigation.	×	0.13

References

- http://arxiv.org/abs/2412.09082v3
- http://arxiv.org/abs/2602.12351v1
- http://arxiv.org/abs/2604.14140v1