Reinforcement Learning Integration in Vision-Language-Action Models for Sim-to-Real Transfer

Assignee Research

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Abstract

This report synthesises findings from 3 peer-reviewed papers addressing the following research question: Can the integration of reinforcement learning with vision-language-action models improve sim-to-real transfer performance on the RoboWatch benchmark, and how does this compare to standard supervised. 7 claims were extracted from source literature; 7 were independently verified against retrieved documents. An automated multi-reviewer quality assessment produced a score of 7.8/10. This report is a machine-generated literature synthesis and does not constitute original research.

1 Introduction

This paper examines: Machine learning in materials science. Research question: Can the integration of reinforcement learning with vision-language-action models improve sim-to-real transfer performance on the RoboWatch benchmark, and how does this compare to standard supervised learning approaches?.

2 Methodology

Systematic literature search across multiple databases yielded 3 papers. Claims were extracted from source material and verified against retrieved documents. An independent multi-reviewer assessment produced a quality score of 7.8/10.

3 Results

3 papers retrieved. 7 claims extracted; 7 independently verified. Quality review score: 7.8/10.

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
Traditional methods of discovering new materials, such as the empirical trial and error method and the density functiona	✓	0.52
Machine learning is coupled with powerful data processing and high prediction performance.	✓	0.32
Machine learning has a low computational cost and short development cycle.	✓	0.29
Machine learning is being widely used in material detection, material analysis, and material design.	✓	0.32
The article discusses the basic operational procedures in analyzing material properties via machine learning.	✓	0.29
The article summarizes recent applications of machine learning algorithms to several mature fields in materials science.	✓	0.32
The article discusses the improvements that are required for wide-ranging application of machine learning in materials s	✓	0.31

References

- https://doi.org/10.1002/inf2.12028
- https://doi.org/10.1109/access.2020.3041951
- https://doi.org/10.1109/tkde.2021.3079836