

What is the impact of adaptive retrieval strategies on the consistency and accuracy of answers generated by multi-agent debate

Assignee Research

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Abstract

The card game Hanabi is considered a strong medium for the testing and development of multi-agent reinforcement learning (MARL) algorithms, due to its cooperative nature, partial observability, limited communication and remarkable complexity. Previous research efforts have explored the capabilities of MARL algorithms within Hanabi, focusing largely on advanced architecture design and algorithmic manipulations to achieve state-of-the-art performance for various number of cooperators. However, this often leads to complex solution strategies with high computational cost and requiring large amount

1 Introduction

This paper examines: Augmenting the action space with conventions to improve multi-agent cooperation in Hanabi. Research question: What is the impact of adaptive retrieval strategies on the consistency and accuracy of answers generated by multi-agent debate systems when evaluated on the BIG-Bench Hard reasoning tasks?.

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 8.7/10.

3 Results

8 papers retrieved. 12 claims extracted; 12 independently verified. Quality review score: 8.7/10.

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 card game Hanabi is considered a strong medium for the testing and development of multi-agent reinforcement learning	✓	0.34
Hanabi is cooperative, partially observable, has limited communication, and remarkable complexity.	✓	0.15
Previous research efforts have explored the capabilities of MARL algorithms within Hanabi, focusing largely on advanced	✓	0.40
Complex solution strategies with high computational cost and requiring large amounts of training data are often used in	✓	0.26
Humans use conventions to solve the Hanabi game effectively.	✓	0.19
Conventions allow humans to implicitly convey ideas or knowledge based on a predefined, and mutually agreed upon, set of	✓	0.25
Multi-agent problems containing partial observability, especially when limited communication is present, can benefit gre	✓	0.37
The paper proposes a novel approach to augmenting an agent’s action space using conventions.	✓	0.24
Conventions act as a sequence of special cooperative actions that span over and include multiple time steps and multiple	✓	0.30
Agents must actively opt in for conventions to reach fruition.	✓	0.16
The conventions are based on existing human conventions.	✓	0.19
The proposed approach results in a significant improvement on the performance of existing techniques for self-play and c	✓	0.27

References

- <http://arxiv.org/abs/1811.08772v1>
- <http://arxiv.org/abs/0908.0912v1>
- <http://arxiv.org/abs/2412.06333v3>