Latex Template for the Proposal

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1 Problem Description

We are going to investigate the idea of the paper "Action Guidance: Getting the Best of Sparse Rewards and Shaped Rewards for Real-time Strategy Games"[1]. The paper introduces the concept of Action Guidance: auxiliary agents trained with shaped rewards that influences the action taken by a main agent trained on only a sparse reward. However, they tested their method only with a single auxiliary agent (opposed to many as they originally suggest). We intend to implement this algorithm and for multiple auxiliary agents and also do a more rigorous evaluation by testing different tasks and evaluate if there is a benefit of multiple auxiliary agents opposed to a single one.

2 Challenges

The implementation might be challenging. Also, finding the right hyper parameters might be very hard for good results.

3 Methods/Algorithms/Implementations

For the implementation we are going to follow the mentioned paper very closely to get comparable results, but we will have multiple auxiliary agents with differently shaped rewards. We will then work out a strategy to sample from these agents to get an action guidance for our main agent. Depending on the computational complexity we might have to shorten the training times, as we may not have the same computational power as the researchers from the paper.

4 Evaluation

We will evaluate the performance of agents trained with action guidance compared to agents trained with a sparse reward and agents trained with conventional reward shaping.

References

[1] Shengyi Huang and Santiago Ontañón. Action guidance: Getting the best of sparse rewards and shaped rewards for real-time strategy games, 2020.

The github page of the paper can be found here