BOOSTING THE EXPLORATION OF REINFORCEMENT LEARNING AGENT THROUGH HUMAN DEMONSTRATIONS

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Abstract

Exploration is a challenging task in reinforcement learning environments with sparse reward signals. This problem is exponential in long horizon tasks with complex state and action spaces which makes the applicability of reinforcement learning in real world problems out of practical use. This research work is to introduce a novel learn from demonstration approach to address this problem by combining human expertise and speed up the training process by minimizing the ignorant learning process of the reinforcement learning agent. Our method is built upon the Deep Deterministic Policy Gradient(DDPG) algorithm and Hindsight Experience replay(HER). This novel approach is successfully proven to outperform the learning efficiency of the baseline algorithm and account for the suboptimality of expert demonstration and overfitting bias of current approaches.

Keywords - Reinforcement Learning, Learning from Demonstrations,