

ADAPTIVE AGENT FOR FPS GAMES USING REINFORCEMENT LEARNING

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Abstract

Artificial adaptive game agent provides the adaptive functionality, to minimize the need of implementing behavior-based agent according to the environment, causing to reduce complexity of an agent implementation. Due to immense benefits provided by the machine learning, artificial gaming agents are implemented using these technologies. The common goal in all of these adaptive agents is to provide the entertainment to the end-users. To acquire the goal for an adaptive agent, various functionalities like dynamic reward system for increasing efficiency in learning process and dynamic weapon preference system for increasing the winning rate of gun fights are required.

Some systems communicate with online algorithms such as Q-learning algorithms, and some systems communicate with offline algorithms, in order to achieve the ultimate goal of learning process. The only difference in such algorithms, is the allocation of reward to an action based on time.

Focusing on artificial game agents, this project addresses these concerns through an adaptive agent, for a first-person shooter game in deathmatch mode.

Dynamic information obtaining through the different state of the agent can be utilized in order to integrate a dynamic reward system. In the same way, information obtained from the weapons during combat states can be utilized to create dynamic weapon preference system based on damage.

Keywords:

Reinforcement learning, Temporal Difference learning, Q-learning, Sarsa learning, Epsilon greedy, Adaptive agent, First person shooter games, Pogamut

Subject Descriptors:

- Machine learning
- Artificial Intelligence
- Game Agents