Abstract

By simulating the psychological and neurological system, deep reinforcement learning method has been playing an important role in the development and application of artificial intelligence with the help of the powerful feature representation capability of deep neural networks. The deep Q network which improves traditional RL methods by breaking out the learning mechanism of value function approximation and policy search based on shallow structure, has the capabilities of hierarchical feature extraction and accurate Q value approximation in various high-dimensional sensing environments.

In this paper, DQN was adapted into Game Pong playing, however, it was found that by adjusting hyperparameters (network architecture, exploration, learning rate), the Q-values could not converge easily. The lacking convergence of the Q-loss might be the limiting factor for better game playing results. A transfer learning approach has been adopted for fast convergence of DQN in game Pong, several measure standards was used as rewards to train DQN, experiments showed that this approach can get fast convergence of DQN training, and DQN
network play good performance on game Pong.

References


Index Terms

Computer Science
Networks
Keywords

DQN; Transfer Learning, Game Pong, Image Evaluation