Research Review

Article:

“Mastering the game of Go with deep neural networks and tree search.”

Goal:

Develop an AI agent that consistently beats professional human player in the game of GO.

Technique:

The authors combine deep convolutional neural network with Monte Carlo tree search. Specifically, the authors apply deep neural network to reduce the depth and breadth of the search tree: evaluating the position using a value network, and sampling actions using a policy network. In particular, the authors start by training a supervised learning policy network directly from expert human moves. Then they train a reinforcement learning policy networks by optimizing the final outcome of games of self-play. Finally, the authors train a value network that predicts the winner of the games predicted by the reinforcement learning policy network against itself.

Result:

The resulting program AlphaGo achieves a winning rate of 99.8% against other Go programs, and defeated human European Go champion by 5 games to 0, which is the first time that a computer program that has defeated human professional player in a full-sized game of Go.