Research Review

Silver, et al., 2016. Mastering the game of Go with deep neural networks and tree search, Nature, Vol. 529, pp. 484 – 489

The golf of this study is to develop an intelligent computer program to master the game of Go and beat professional human Go players and other computer programs of the game of Go. Due to the complexity of the game, it is impossible to find the optimal move at any given state through exhaustive search. Unlike other studies which are based on Minimax with approximate value functions or Monte Carlo tree search (MCTS), this study integrated the MCTS technique and other policy search techniques including: a conventional neural network to reduce the effective size of search tree. A supervised learning algorithm to obtain policy, a reinforcement learning algorithm to improve the policy network and a value network.

The performance of the AlphaGo algorithm outperformed almost all other Go programs with a winning rate of 99.8% and defeated a world-renowned professional Go player, the human European Go champion, Fan Hui with 5 – 0 and 3 – 2 respectively, under no handicap and Chinese rules.