Alpha Go

The paper's goal is to build a program that can play Go and can defeat a human professional player.

Many attempts have been made to build such a program, and the previous programs use techniques like Monte Carlo Tree Search and supervised learning. A unique approach of this paper is to use deep convolutional neural networks treating the board position as a 19x19 image to reduce the effective depth and breadth of the search tree. MC method tries to randomly generate possible moves of its players and successive moves by the opponent, and evaluate the value of each move. To achieve this, it uses massive computing power. One of the keys to successful programs is to make the tree search effective in that it can ignore cases that do not matter.

Supervised Learning is also used so that it can behave like a professional player. It is trained to predict human expert moves. Reinforcement Learning is then used so that it can improve the SL policy network.

With combination of SL, RL and Deep Convolutional Networks, the program, AlphaGo, achieved a 99.8% winning rate against other Go programs and defeated the European Go Champion by 5 games to 0.