

AlphaGo

AlphaGo is a Deep Learning algorithm designed to play the game of Go. The goal for the algorithm is to learn how to play Go and beat both human and computer players. Go is a particular difficult game to solve simply by searching the end nodes given that the space of possible moves is very extensive. Previous state-of-the-art algorithms used Monte Carlo Tree Search to evaluate positions and choose an action.

The biggest contributions by AlphaGo was to use a combination of deep convolution neural nets and reinforcement learning to evaluate states or positions in Go. The CNN was used to evaluate and predict professional Go player moves and create a policy, and then the policy was updated using RL to adjust the policy to optimize for winning games, not predicting moves. Then, it used a Monte Carlo Tree Search to choose from the policy and value networks. One caveat of this approach is that it takes longer to evaluate positions compared to previous algorithms. For this reason, AlphaGo can also be run on top of parallel computers to improve the speed of search.

AlphaGo was able to beat the European Go champion and won 99% of all games played with other Go computer players. AlphaGo also achieved a *dan* (professional Go scoring level) similar to that of professional Go players.