

Research Review - Alpha Go

Alpha Go was a remarkable accomplishment in the realm of artificial intelligence. It was predicted that the game would not be solved by a computer program for the next ten years, yet it was solved by the team of Deep Mind at google. The reason why is that Alpha Go has a large search space. There are 250^{150} possible sequences of moves in Alpha Go. That search space is infeasible to traverse through even with all the computation power we have in the world. So we know a brute force approach is out of the question, so what other solutions has scientist come up with?

The Game of Go has some interesting properties that we strategically tackle by examining them. Go is fully deterministic like the game of isolation. You can determine the winner if you know exactly the sequence of moves being played. Although not possible with today's technology to map out the entire search space. The game is also fully observed, so each player has all the information on each move. The game is also discrete because each move is a discrete move.

Scientists used Machine Learning, to solve this problem. Alpha Go is made up of many different well known techniques, behavior cloning, reinforcement learning, value functions, and Monte Carlo Tree Search. The big accomplishment was being able to combine these techniques to create a game playing system like Alpha Go. First they used a supervised learning technique that feeds its output into a reinforcement learning technique, which perfect it's game play. Then that output is feed into a value function that is plugged into the Monte Carlo Tree Search.

In Conclusion, Alpha Go was a huge accomplish for artificial intelligence. Many people said that the breakthrough of Go may point to "Intuition" in a machine algorithm. The algorithm

that Alpha Go is built on is also said to be a narrow AI algorithm, as the exact algorithm can not be used for more generalized task. It is however still an amazing feat.