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July 10, 2017

AlphaGo

AlphaGo is a software that uses artificial Intelligence to play the game Go. The game Go is one of the most challenging and complex game in the world, more complicated than chess. The complex of this game is, to win the game someone needs to have intuition for making the movements, and it was a weakness of machines, nevertheless the sophisticated algorithms of AlphaGo made it possible to beat humans, AlphaGo already beat one of the world's top Go players, the computer analyzed different possible strategies and made the best to win the game.

AlphaGo uses different algorithms may be solved by recursively computing the optimal value function in a search tree containing approximately b^d possible sequences of moves, where b is the number of legal moves per position (breadth ≈ 250) and d is the game length (depth ≈ 150). It uses Monte Carlo tree search and deep convolutional neural networks to reduce the breadth and depth of the search tree. Alpha Go trains a supervised learning policy network from human moves. It also defines a reinforcement learning policy network that improves the supervised learning policy by optimizing the final outcome of games self-play. Finally, it trains a value network which predicts the winner of games played by the reinforcement learning policy network against itself.

Alpha Go developed and effective move selection and position evaluation for Go. Alpha Go developed a novel approach that combines neural networks that are trained using supervised learning and reinforcement learning. It also introduces a new search algorithm that combines neural network evaluations with Monte Carlo rollouts.

Alpha Go was also developed as a distributed system of multiple machines that consist of 40 search threads, 1,202 CPUs, and 176 GPUs. AlphaGo is the first artificial intelligence system that defeated a human professional player in the full game of Go.