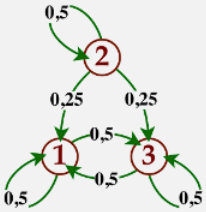
THE ULTIMATE AI ALGORITHMS

ITEM #1

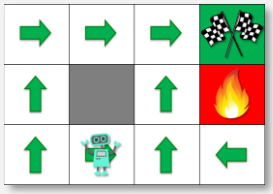
Markov Decision Processes (MDP)



A Markov Process is when future states depend only on the present state and not the past. An MDP is an optimization problem where the goal is to find the optimal action to take in any given state. This is done through maximization of cumulative rewards that may occur if optimal actions are taken in the future.

ITEM #2

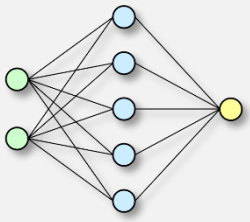
Q-Learning



Q-Learning is one of the simplest types of reinforcement learning algorithms. It invokes the Bellman equation to calculate the attractiveness of each possible action in a given state and then decides which action is the best to take. Q-Values are updated through an iterative process as the AI learns how to accomplish its goals.

ITEM #3

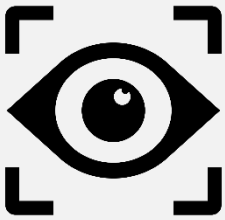
Deep Q-Learning



Deep Q-Learning is the result of combining Q-Learning with an Artificial Neural Network. States are encoded by a vector which is passed into the Neural Network as input which in turn produces a Q-Value for each action as output. Overlaying a softmax function gives us the best possible action in the current state.

ITEM #4

Deep Convolutional Q-Learning



Adding another layer of sophistication in Deep Convolutional Q-Learning – we no longer work with vectors of values to describe states – instead the inputs to the Neural Network are pixels. Meaning that the AI now actually sees exactly what a human sees and has to learn and make decisions based on visuals.

ITEM #5

Asynchronous Actor-Critic Agents (A3C)

Google's A3C is like the random forest of AI: instead of having one neural network predict the best action, several neural networks (agents) are learning at the same time. This approach blows all other algorithms out of the water and as of today, A3C is the most cutting-edge AI algorithm on the planet.

[Join The SuperDataScience Facebook Group And Accelerate Your Career]