Reinforcement Learning

The goal of reinforcement learning it to maximize a cumulative reward function (or equivalently, minimize a cumulative cost function), given a set of actions and results. Reinforcement learning was modeled to resemble the way we observe learning in the real world. Being curious creatures, we try many different new things. Most of the time, nothing of merit occurs from the things we experiment with. But occasionally, we stumble upon a set of actions that that result in a sweet reward. When this happens, we attempt to back trace our steps and repeat similar actions that will result in our getting rewarded. If we are rewarded yet again, we further associate those actions with the reward and that is known as the reinforcement cycle. The entire process is also known as performance maximization.

More Examples

- Discover how to fly a quadcopter by minimizing the function which evaluates the chance of crashing.
- Learn to beat a video game like 'Super Mario Bros.' by minimizing the time it takes to get to the castle.
- Attempt to take a photo and "re-draw" it in the style of a particular artist.

- Automate the trading of stocks and securities by balancing the maximization of profit and minimization of transaction fees.

Reinforcement learning is actually a completely different category of learning from supervised and unsupervised learning. It's closer to supervised learning than it is to unsupervised learning, but you could get away with calling it semi-supervised learning. To learn more about reinforcement learning, take a look at the dive deeper section.