

Customer and Partner Engagement

Practical insights on loyalty, incentive, referral, rewards, and engagement programs that help organizations create stronger customer and partner relationships.



Reinforcement Learning – An Effective Machine Learning Algorithm



Rohit Singh • VP of Customer Engagement • [Schedule Free Consultation](#)



Reinforcement learning requires a framework to solve a problem. The essential problem of exploitation and exploration would be first understood and then the framework would be defined to solve the reinforcement learning problems. The Markov Decision Process is useful for creating a mathematical framework for a problem in order to determine the solution through designating the set of actions, set of states, the policy, the reward function, and the value. Another method that can be used is the shortest path problem to determine the framework.

Reinforcement learning is one of the better machine learning algorithms. There are different types of machine learning methods and their comparison with reinforcement learning is mentioned.

- Supervised Learning: The difference between supervised learning and reinforcement learning has already been mentioned above wherein it was stated that there is a supervisor for supervised learning and he or she has the knowledge of the environment.
- Unsupervised Learning: In order to achieve output, there is a mapping of input in reinforcement learning. It is not found in unsupervised learning as its main task would be to discover the underlying patterns instead of just mapping. For instance, the unsupervised learning algorithm would go through similar articles to suggest a news article based on what the individual has read in the past. As for reinforcement learning, when it comes to recommending content, it would require feedback from users constantly as it would suggest a few articles and based on its results, it would create a knowledge graph to determine the type of articles that the user prefers to read.
- Semi-Supervised: It is basically a combination of unsupervised and supervised learning and is different from reinforcement learning as it uses direct mapping, unlike reinforcement learning.

Implementation of Reinforcement Learning

The Deep Q Learning algorithm can be used to create a policy that is based on the learning algorithm. It would function similarly to a neural network. Google has used this same algorithm to defeat humans in Atari games. The following steps help establish the algorithm.

- The values of the table should be initialized.
- The current state has to be observed.
- Select action for each state based on the selection policies.
- Observe the reward by taking the action, including the new state.
- The value for each state should be updated with the maximum reward possible and the observed reward for the proceeding state. The updating has to be done in accordance with the parameters and formula as stated.
- The state should be set to the new state and the process has to be repeated until the terminal state has been reached.

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VP of Customer Engagement

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NextBee Corporation
155 Bovet Rd Suite 700
San Mateo, CA 94402



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1-800-547-1618