

Chapter 11

Adaptive Clinical Treatments and Reinforcement Learning for Automatic Disease diagnosis

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ABSTRACT

Machine learning models are taught how to make a series of decisions depending on a set of inputs in reinforcement learning. The agent learns how to accomplish a goal in an unexpected, maybe complex environment. Reinforcement learning places artificial intelligence in a game-like environment. It solves the problem by trial and error. Artificial intelligence is rewarded or punished based on its actions. Its purpose is to maximize the amount of money paid out in total. In addition to providing the game's rules, the designer does not give any feedback or recommendations on how to win the model. To maximize reward, the model must determine the optimum way to do a job, beginning with purely random trials and progressing to complex techniques and superhuman abilities. Reinforcement learning, with its power of

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search and diversity of trials, is likely the most effective strategy for hinting at a system's originality. Unlike humans, AI can learn from thousands of concurrent gameplays if a reinforcement learning algorithm is run on sufficiently efficient computer infrastructure.

INTRODUCTION

Reinforcement learning is a type of machine learning. It is about acting appropriately in a given situation to maximize gain. Various apps and computers utilize it to evaluate the best potential behavior or course of action to take in a particular event (Jiwani et al., 2021).

Developers create a system for rewarding desired activities and penalizing undesirable Reinforcement learning. This strategy motivates the agent by assigning positive values to preferred activities and negative values to undesired behaviors. To arrive at an appropriate solution, the agent is trained to seek the highest long-term and total benefit (Whig, Velu, & Naddikatu, 2022).

These long-term goals are critical to preventing the agent from becoming stuck on smaller targets. Through time and experience, he or she learns to avoid the bad and focus on the good(Whig, Velu, & Sharma, 2022). This learning strategy has been used in artificial intelligence (AI) to drive unsupervised machine learning using incentives and penalties. Figure 1 depicts the fundamentals of reinforcement learning, while Figure 2 depicts how it works.

Reinforcement Learning

The primary elements necessary for Reinforcement Learning are defined as follows: Input might be regarded as a beginning state from which the model will begin. O/P: There are several possible outputs for a range of solutions to a given problem. Learning: Depending on the input, the model will return a state, and the user's feedback will determine whether to reward or penalize the model based on the outcome(Alkali et al., 2022a).

The model is still learning.

The optimal answer is determined by the highest possible payment.

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