

A STUDY OF REINFORCEMENT MACHINE LEARNING AND SUPERVISING THE MACHINE PERFORMANCE IN PROBABILISTIC APPROACH

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Abstract- Reinforcement Machine Learning is type of learning which includes the partial feedback from the system itself and observe environment behavior with their agents or boids. This algorithm includes manipulation of data-set the task T, performance P and experience E with respect to time t. Reinforcement Machine Learning is all about the environmental behavior related to task and its effects on the task. It deals with the learning of scenarios and situations associated with. Markov Decision Process is one of reinforcement machine learning technique which helps in decision making for particular scenarios. But MDP will does not provide any kind of probabilistic approach towards learning the scenario .MDP algorithm consider the probability of learning 1 as default . This sometime considering the learning probability leads to erroneous output. Probabilistic approach in reinforcement machine learning makes the learning process more optimal in nature and exhibits all possible scenario of learning. In short probabilistic approach will help the machine to think before learn the data-set by calculating the probability of learning the optimal among the feasible outcomes.

Keywords– Reinforcement machine learning, partial feedback, agents, behavior, Markov Decision Process, Probabilistic approach.

1. INTRODUCTION

Probabilistic Machine Learning is the new way of learning the scenario with the agents and environmental behavior towards the task T of performance P with experience E with respect to time t. Probabilistic method will enable the machine to learn all possible outcomes of scenario and select the case which have high probabilistic scenario to succeed in learning. This kind of approach towards the learning will be suitable for the neural network or support vector machine with feedback felicity which also consist of behavioral concepts in the consideration. In short probabilistic approach will help the machine to think before learn the data-set by calculating the probability of learning the optimal solutions among the feasible.

2. PROPOSED ALGORITHM

2.1 Probabilistic Adaptive Neural Network –

Probabilistic adaptive neural network (henceforth called as PANN) will determine the most accurate way of solving the problems. PANN is neural network which mimic the ADALINE but with additional capacity of learning the scenario through the probabilistic approach. It will calculate the all possible scenario of the task t and list it out as sample space of the task. After creating the all outcomes, PANN will learn the all feasible ways to solve the neural net. During the learning process it will take the environmental affect and task behavior to account. It determines there are challenges neural net is facing to solve the task. It will check what are the component which are affecting the task in positive (catalyzes) and negative (inhibitor) ways. PANN will encourage the catalyzing factors affecting task and derive the most accurate way of solving the neural net. PANN also ignore or neglect the inhibitor properties of boids by doing least mean square of feasible outcomes and inhibitor outcomes.

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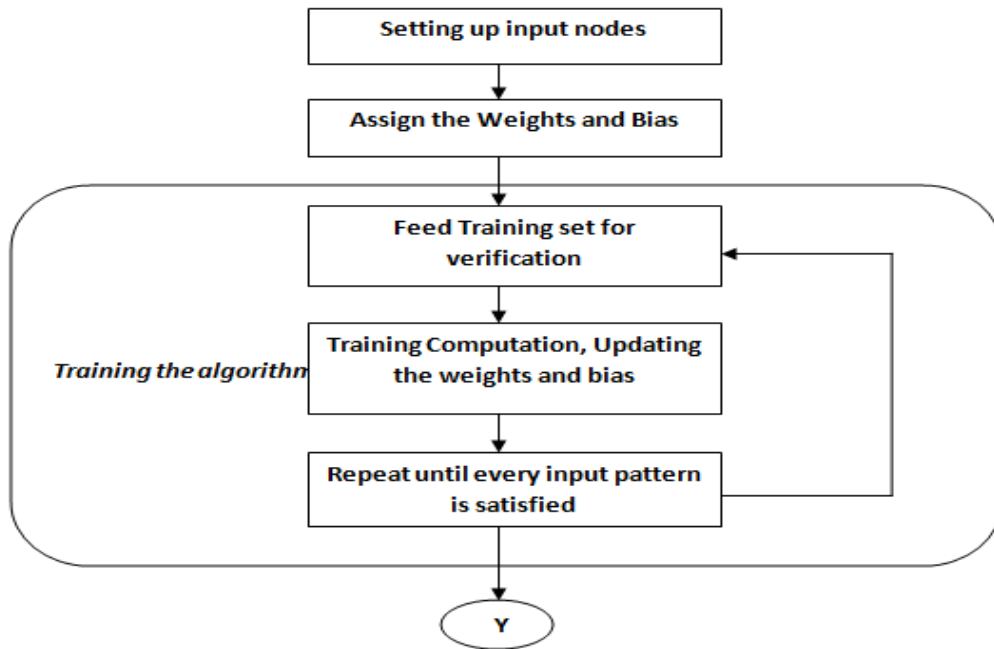


Figure 1. General Adaptive Learning Network

Above diagram represent the Adaptive Linear Learning network which performs square mean error method to find out the difference between actual output and expected output. SME will lower the difference between the actual output but do not exhibit the any features of task behavior towards performance with respect to experience E.

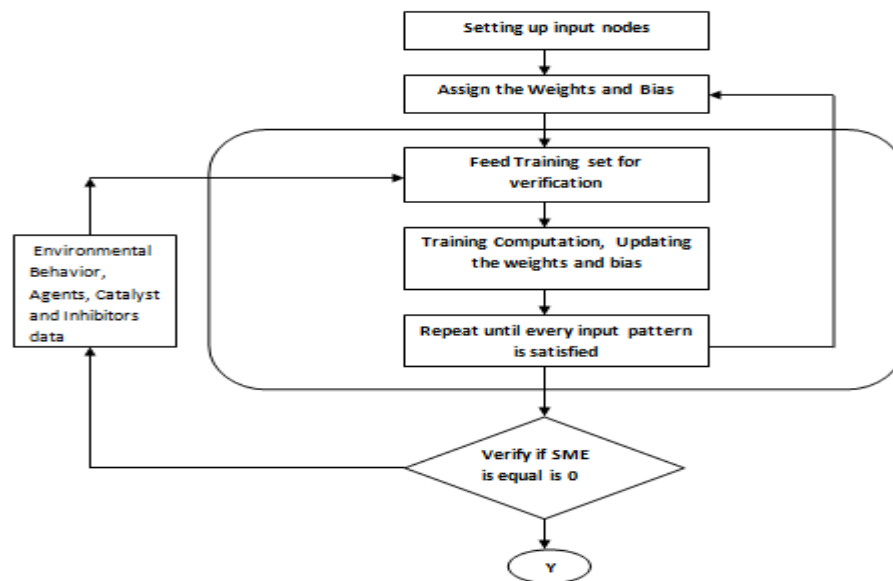


Figure 2. Probabilistic approach neural network.

Diagram 2 pictorially represent PANN algorithm which adaptively learn the scenarios and consider all feasible solution to perform the task T. Behavioral affects, agents affects over the task T will be observed in each experience levels of task and solution will be adapted accordingly. Since it consider the environmental agents which catalyze the task, the actual output will be greater than the expected output. Hence it improves the performance of algorithm in lower level of experience.

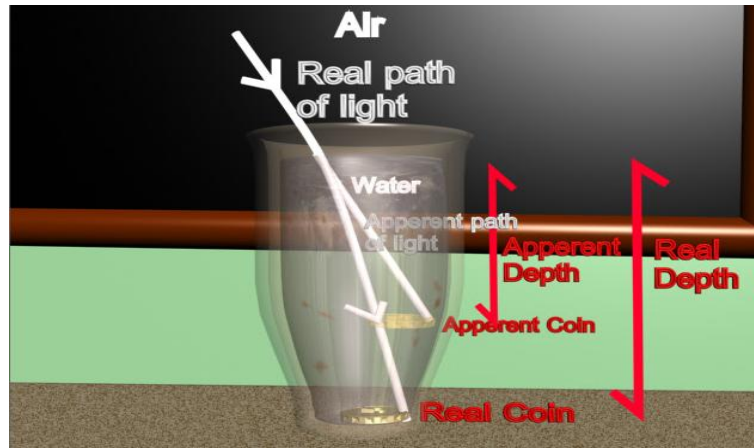
$$Q(w) = d/dw [(\alpha * wi) + \{1/n \times (\sum Qi(w))\}] \tag{1}$$

$$We = We - \{W(e-1) - \{\alpha[\sum \Delta Qi(w(e)/\alpha] - (a(e) - \alpha(e-1))\}\} \quad (2)$$

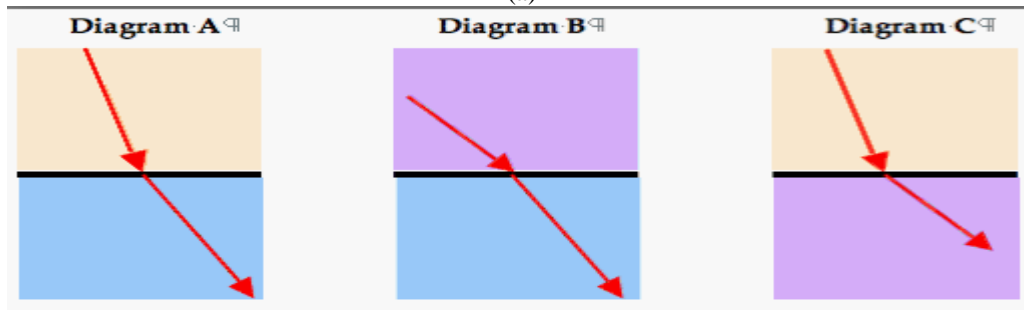
3. EXPERIMENT AND RESULT

The test for this algorithm is conducted on the machine with 2GB DDR3 RAM with graphics of GTX 980M.I used the numpy package for certain data visualization purposes. This includes the following diagram as data-set for the data manipulation. For the experimentation purposes, I switched to R programming language in Rodeo IDE. I programmed some behavioral analogies in octave for the extreme data-visualization purposes.

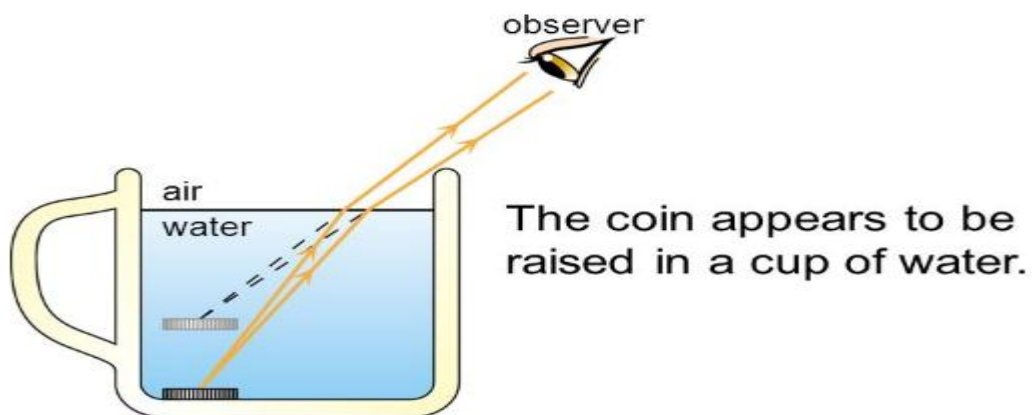
The task machine is performing is to analyses of the scenario and provides feedback to training set to perform the computation in both ideal and real-time scenario. In ideal scenario coin is placed in a glass-flask and its co-ordinates drawn in-terms of graphical representation. Then machine performed the task T in experience level E2. But when the same glass is filled with the liquid of refractive index greater than 1 or less than 1, machine throws the erroneous output. By applying the PANN algorithm, machine took the consideration of environmental behavior and performs the task successfully.



(a)



(b)



(c)

Figure 3. (a) Original image (b) Feasible Path considering different affecting boids Image (c) PANN algorithm selected path

Table -1 Experiment Result

	Adaptive Network performance	Probabilistic Adaptive algorithm(PANN)
Machine Performance with E1	70.00%	76%
Machine Performance with E2	79.00%	92%
Machine Performance with E3	89.00%	96%

Table 1 designates that the PANN performance is better compared to traditional linear adaptive learning Algorithm. PANN calculated the probabilistic outcomes from feasible path of task and perform the same. Even-though the adaptive learning algorithm performed well but it can not meet the targets if there is continuous change in the environment but whereas PANN will learn the scenarios in changing environment and they can perform well.

4. CONCLUSION

PANN is an algorithm which will adapt to the dynamically changing environment and consider their respective bids to perform the task better. This algorithm will change according to the environmental setup and perform without giving erroneous output.

5. REFERENCES

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