Aashish Prateek
10 April 2020

Machine Learning

Assignment-1

Q1) Do you think DL will be replacing ML in the near future? Why?

Ans.) Deep learning will not necessarily replace Machine Learning anytime in the near future, mainly due to it's following drawbacks over Machine learning:

1.) Deep learning is an algorithm that contains many neurons(around 150 minimum), this implies that the computational costs exponentially increase, and hence the overall costs of the project increases which can easily be substituted by skilled humans for relatively lesser labour costs.

2.) Deep learning is responsible for feature extraction as well as it's classification, whereas machine learning algorithm is mainly used only for classification related tasks, or only for predicting the output. So a very skilled developer must design the algorithm for deep learning who requires a lot of specialisation and experience which in number may be a very few.

3.) Deep learning relies on very large amounts of input sample data for it to work better. So in cases where we have insufficient data related to the task, Depp learning will mostly be very inaccurate.

Q2. What are the pros and cons of Supervised, Unsupervised and Reinforcement Learning?

Ans. Pros of Unsupervised learning:

1.) It is faster to implement than unsupervised learning since no data labelling is required here. Hence it is a fast process.

2.) The algorithm has the potential to provide unique, disruptive insights for a business to consider as it interprets data on its own.

Cons of unsupervised learning:

1.) The accuracy of the algorithm can't be measured as unsupervised learning has no output, so we can't verify if it's correct or not.

2.) It does not naturally deal with high-dimensional data. When the dimension of data and the number of variables become more and need to be reduced in order to work on that data, then the human involvement becomes necessary to clean the data. So it can't work with many variables accurately.

Pros of supervised learning:

1.) There Is a clear objective of this algorithm unlike unsupervised machine learning.

2.) The accuracy of these models can be measured easily because there is an output in this case which can be verified manually.

3.) The training of the machine is tightly controlled, which in return gives an outcome of a very specific behaviour.

Cons of supervised learning:

1.) It often becomes labor-intensive as the data requires labeling before the model is trained, which can take hours of human effort. The cost becomes astronomical then and the training process gets slowed down.

2.) We are limit the insight for a machine to explore, as the predicted behavior is mentioned in advance. There is no freedom for the machine to explore other possibilities.

Pros of reinforcement learning:

1.) Reinforcement learning can be used to solve very complex problems that cannot be solved by conventional techniques.

2.) This learning model is very similar to the learning of human beings. So it Is as real as it gets.

3.) It can be useful when the only way to collect information about the environment is to interact with it.

4.) In the absence of a training dataset, it is bound to learn from its experience.

Cons of reinforcement learning:

1.) Too much reinforcement learning can lead to an overload of states which can diminish the results. Which means that the presence of many variables to take into account would contradict many other variables output.

2.) Reinforcement learning needs a lot of data and a lot of computation. It is data-hungry.