Machine learning is considered as Programming Mastery, there are many different algorithms/methods to achieve desired results. The machine is made to learn new information using data provided. This can be achieved through many different methods.

# Advantages and Disadvantages of Machine Learning

One of the main positives of machine learning is feature learning, ‘a system randomly initialised and trained on some datasets will eventually learn good feature representations for a given task’ (Bupe 2015). Computers are increasingly growing and improving in the field of machine learning and feature learning is extremely important in the fields of imagine and speech recognition.

Parameter optimisation is another advantage of machine learning. In a lot of cases, machine learning has to optimise a very large set of parameters to make sure things work. Such architecture can be extremely extensive and time consuming for a human to do such as a neural architecture can have billions of parameters. ‘Large scale machine learning algorithms such as stochastic gradient descent is used to find and optimal setting’ (Bupe 2015)

One disadvantage is that machine learning will not work for every single case, it is limited to what it can do. This can be fixed by changing machine learning algorithms and applying them in the right cases. This can be very time consuming but once you get the right algorithm for the right case it should be able to work.

Extremely large datasets are required for machine predictions to be very accurate. Time gathering can take a lot of time and be expensive if you cannot find enough secondary data and you have to create the data yourself through surveys, questionnaires etc.

# Supervised Learning

Supervised learning is one method of doing machine learning, this method trains the model with a set of labelled data. ‘You teach the algorithm what you want it to look for. Based on the training set, the algorithm builds a model that can make predictions when giving a new set of data’ (Forsblom 2015). A good example of unsupervised machine learning is when you are trying to make the computer recognise some kind of animal – you give it so many pictures of that animal until it can recognise one. This feature is used on Apple Devices in the Photos App. In most cases, the more data you feed it the higher the predictive power is because it can make more comparisons.

A pro for supervised learning is that it can work if you have a really large dataset of data for the machine to compute and then process every time to make an output of an unseen input. Although the machine is only limited to the data that you have provided it with.

A con for supervised learning is that supervised learning can take way too much time to be completely effective. Predictions are highly based on the dataset that the machine was provided with and those are very often and limited and even if the size of the trained dataset can be enormous, there is still a chance that it will not be accurate enough. ‘Supervised learning is limited in terms of scalability of the target function at hand’ (Orhon 2016).

# Unsupervised Learning

Unsupervised learning can be extremely effective. In this case ‘you give the algorithm a set of examples, but the examples are not labelled. The algorithm receives no feedback from the world at all’ (Forsblom 2015). This means that the algorithm organises the inputs ‘into groups on its own based on similarities and differences among input patterns’ (Forsblom 2015).

The advantage of unsupervised learning is that no training is provided for the system. ‘The results of clustering algorithms are data driven, hence more natural and better suited to the underlying structure of the data’ (Segal-Halevi 2012).

Although the fact that unsupervised learning is more natural and can be a lot more efficient has its drawbacks because of the fact that you do not provide the machine with any training and classification of the data it means that ‘it is difficult to judge the quality of clustering results’ (Segal-Halevi 2012)

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