

TYPES OF MACHINE LEARNING

1)Supervised learning

We have supervised learning when a computer uses given labels as examples to take and sort series of data and thus to predict future events.

Pros:

- It allows you to be very specific about the definition of the labels. In other words, you can train the algorithm to distinguish different classes where you can set an ideal decision boundary.
- You are able to determine the number of classes you want to have.
- The input data is very well known and is labeled.
- The results produced by the supervised method are more accurate and reliable in comparison to the results produced by the unsupervised techniques of machine learning. This is mainly because the input data in the supervised algorithm is well known and labeled. This is a key difference between supervised and unsupervised learning.
- The answers in the analysis and the output of your algorithm are likely to be known due to that all the classes used are known.

Cons:

- Supervised learning can be a complex method in comparison with the unsupervised method. The key reason is that you have to understand very well and label the inputs in supervised learning.
- It doesn't take place in real time while the unsupervised learning is about the real time. This is also a major difference between supervised and unsupervised learning. Supervised machine learning uses of-line analysis.
- It needs a lot of computation time for training.
- If you have a dynamic big and growing data, you are not sure of the labels to predefine the rules. This can be a real challenge.

2)Unsupervised learning

the machine is expected to find the hidden patterns and structure in unlabeled data by their own. That's why it is called unsupervised – there is no supervisor to teach the machine what is right and what is wrong.

Pros:

- Less complexity in comparison with supervised learning. Unlike in supervised algorithms, in unsupervised learning, no one is required to understand and then to label the data inputs. This makes unsupervised learning less complex and explains why many people prefer unsupervised techniques.
- Takes place in real time such that all the input data to be analyzed and labeled in the presence of learners. This helps them to

understand very well different models of learning and sorting of raw data.

- It is often easier to get unlabeled data — from a computer than labeled data, which needs person intervention. This is also a key difference between supervised and unsupervised learning.

Cons:

- You cannot get very specific about the definition of the data sorting and the output. This is because the data used in unsupervised learning is labeled and not known. It is a job of the machine to label and group the raw data before determining the hidden patterns.
- Less accuracy of the results. This is also because the input data is not known and not labeled by people in advance, which means that the machine will need to do this alone.
- The results of the analysis cannot be ascertained. There is no prior knowledge in the unsupervised method of machine learning. Additionally, the numbers of classes are also not known. It leads to the inability to ascertain the results generated by the analysis.

3) Reinforcement Learning

It is about taking suitable action to maximize reward in a particular situation. It is employed by various software and machines to find the best possible behavior or path it should take in a specific situation.

Pros:

- Reinforcement learning can be used to solve very complex problems that cannot be solved by conventional techniques.
- This technique is preferred to achieve long-term results which are very difficult to achieve.
- This learning model is very similar to the learning of human beings. Hence, it is close to achieving perfection.
- The model can correct the errors that occurred during the training process.
- Once an error is corrected by the model, the chances of occurring the same error are very less.
- It can create the perfect model to solve a particular problem.
- Robots can implement reinforcement learning algorithms to learn how to walk.
- In the absence of a training dataset, it is bound to learn from its experience.
- Reinforcement learning is intended to achieve the ideal behavior of a model within a specific context, to maximize its performance.
- It can be useful when the only way to collect information about the environment is to interact with it.

Cons:

- Reinforcement learning as a framework is wrong in many different ways, but it is precisely this quality that makes it useful.
- Too much reinforcement learning can lead to an overload of states which can diminish the results.
- Reinforcement learning is not preferable to use for solving simple problems.
- Reinforcement learning needs a lot of data and a lot of computation. It is data-hungry. That is why it works really well in video games because one can play the game again and again and again, so getting lots of data seems feasible.
- Another disadvantage is the curse of real-world samples. For example, consider the case of learning by robots. The robot hardware is usually very expensive, suffers from wear and tear, and requires careful maintenance. Repairing a robot system costs a lot.

DEEP LEARNING IS GOING TO REPLACE MACHINE LEARNING IN THE NEAR FUTURE?

I don't think Deep Learning can replace Machine Learning in the future as DL is a subset of ML. Deep learning algorithms heavily depend on high-end machines. As the computational costs increase in the future, the overall cost of the project increases. It requires a large amount of input. If we have insufficient data, deep learning will be inappropriate.