**MACHINE LEARNING**.

Machine learning is an approach by which machines are trained on data sets in order to improve future

performance. The main goal of this discipline is automatic learning paradigm. Machine Learning refers

to algorithm update based on past data sets automatically without any human supervision [1].

Using Machine Learning, the programmer develops an approach through which the machine (the algorithm) will come up with its own solution based on the data sets it has been trained on [1].

**MACHINE LEARNING: INTERSECTION OF STATISTICS AND COMPUTER SCIENCE.**

Machine Learning is the brain child Computer Science and Statistics. Computer Science in this field focuses on developing machines that solve different problems, and tries to determine weather problems can be solved at all. Statistics employs data inference, modelling hypothesis and measuring reliability of the conclusions. Machine learning concentrates on the task of getting machines to re-program themselves whenever new data are exposed to them through what they have learned from the trained data sets, whereas Computer Science focuses on programming computers manually to solve a particular problem. On the other hand, Statistics concentrate on data probability and analysis, it plays an important role concerning the practicability and effectiveness of machine learning algorithms to process data sets [1].

**MACHINE LEARNING AND HUMAN LEARNING.**

Yann LeCun proposed that the ability of a machine to learn from data sets is mostly not different from how a human mind learn with time and experience [2]. Although, the concentration on solving machine learning problems by miming how the human brain works did not produce a suitable result. This could be because of the reason that human or animal psychology still remains not fully understood. However, the collaboration between machine learning and human learning is increasing, because human learning is being used as the backbone to explain several machine learning techniques. For example, artificial neural network for building machine learning models are inspired by the brain neural network [2].

**DATA MINING, ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING.**

Analytically speaking, these three disciplines are so connected that it is impossible to draw a boundary between them. However, these three disciplines are interdependently related and a collaboration of these disciplines can be used as a strategy to yield more sensitive and efficient outputs. Data mining basically involves the explanation of data, it is the basis for both machine learning and artificial intelligence. Also it is not only inspection of information from different sources but it analyzes and extract pattern that occur in information that could have been difficult to interpret manually. Data mining is not only to prove a hypothesis but also for drawing appropriate hypothesis. The mined data and its corresponding hypothesis and pattern is used as the basis for both artificial intelligence and machine learning. Artificial intelligence can be referred to as the ability of a machine to solve problems on their own without any supervision from human. Artificial intelligence used data minded to solve problems not by programming the solution into the system. Machine learning takes this paradigm to the next level by providing the data needed for a machine to learn and make successful predictions when exposed to new data [1].

The machine extracts information from the train data sets, and then recognizes hidden patterns using various statistical measures to better its ability to interpret new data and produce much more effective results.

**APPLICATIONS**

A definite sign of intelligence in Machine Learning is its importance in real-life applications, some of

these are explained below [1].

1. **SPEECH RECOGNITION**

One of the application is speech recognition. All these speech recognition use machine learning paradigms to train the systemfor better speech accuracy.

**2. COMPUTER VISION**

Recently, vision systems, e.g., facial recognition software, which are systems capable of automatically classifying microscopic images of cells; employ machine learning approaches for better accuracy.

**3. ROBOT OR AUTOMATION CONTROL**

Machine Learning methods are used in robot and automated systems. For example, consider the control strategies for stable flight and aerobatics of helicopters can be achieved through machine learning. Google’s self-driving car is a real Machine Learning application.

**4. BIO-SURVEILLANCE**

Tracking possible outbreak of diseases can be achieved by using Machine Learning models. The software system is trained using the profiles of admitted patients in order to detect anomalous symptoms, their patterns and their area and level of distribution. There are still ongoing studies to integrate additional data in the system, like medicines’ purchase history to provide more training data sets [1].

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