

Lecture 2

Artificial intelligence vs Machine Learning vs Deep Learning

Nowadays many misconceptions are there related to the words **machine learning**, **deep learning** and **artificial intelligence(AI)**, most of the people think all these things are same whenever they hear the word AI, they directly relate that word to machine learning or vice versa, well yes, these things are related to each other but not the same. Let's see how.

Machine Learning:

Before talking about machine learning lets talk about another concept that is called data mining. Data mining is a technique of examining a large pre-existing database and extracting new information from that database, it's easy to understand, right, machine learning does the same, in fact, machine learning is a type of data mining technique.

Here's is a basic definition of machine learning –

“Machine Learning is a technique of parsing data, learn from that data and then apply what they have learned to make an informed decision”

Now a days many of big companies use machine learning to give there users a better experience, some of the examples are, Amazon using machine learning to give better product choice recommendations to there costumers based on their preferences, Netflix uses machine learning to give better suggestions to their users of the Tv series or movie or shows that they would like to watch.

Deep Learning:

Deep learning is actually a subset of machine learning. It technically is machine learning and functions in the same way but it has different capabilities.

Deep learning combines advances in computing power and special types of neural networks to learn complicated patterns in large amounts of data. Deep learning techniques are currently state of the art for identifying objects in images and words in sounds. Researchers are now looking to apply these successes in pattern recognition to more complex tasks such as automatic language translation, medical diagnoses and numerous other important social and business problems.

The main difference between deep and machine learning is, machine learning models become better progressively but the model still needs some guidance. If a machine learning model returns an inaccurate prediction then the programmer needs to fix that problem explicitly but in the case of deep learning, the model does it by himself. Automatic car driving system is a good example of deep learning.

Let's take an example to understand both machine learning and deep learning – Suppose we have a flashlight and we teach a machine learning model that whenever someone says

“dark” the flashlight should be on, now the machine learning model will analyse different phrases said by people and it will search for the word “dark” and as the word comes the flashlight will be on but what if someone said “I am not able to see anything the light is very dim”, here the user wants the flashlight to be on but the sentence does not consist the word “dark” so the flashlight will not be on. That’s where deep learning is different from machine learning. If it were a deep learning model it would on the flashlight, a deep learning model is able to learn from its own method of computing.

Artificial intelligence:

Now if we talk about AI, it is completely a different thing from Machine learning and deep learning, actually deep learning and machine learning both are the subsets of AI. There is no fixed definition for AI, you will find a different definition everywhere, but here is a definition that will give you idea of what exactly AI is.

“AI is a ability of computer program to function like a human brain ”

AI means to actually replicate a human brain, the way a human brain thinks, works and functions.

The word Artificial Intelligence comprises of two words “Artificial” and “Intelligence”. Artificial refers to something which is made by human or non natural thing and Intelligence means ability to understand or think. There is a misconception that Artificial Intelligence is a system, but it is not a system. AI is implemented in the system. There can be so many definition of AI, one definition can be ***“It is the study of how to train the computers so that computers can do things which at present human can do better.”*** Therefore It is a intelligence where we want to add all the capabilities to machine that human contain.

The key difference between AI and ML are:

ARTIFICIAL INTELLIGENCE	MACHINE LEARNING
AI stands for Artificial intelligence, where intelligence is defined as a ability to acquire and apply knowledge.	ML stands for Machine Learning which is defined as the acquisition of knowledge or skill
The aim is to increase chance of success and not accuracy.	The aim is to increase accuracy, but it does not care about success.

It work as a computer program that does smart work.	It is a simple concept machine takes data and learn from data.
The goal is to simulate natural intelligence to solve complex problem	The goal is to learn from data on certain task to maximize the performance of machine on this task.
AI is decision making.	ML allows system to learn new things from data.
It leads to develop a system to mimic human to respond behave in a circumstances.	It involves in creating self learning algorithms.
AI will go for finding the optimal solution.	ML will go for only solution for that whether it is optimal or not.
AI leads to intelligence or wisdom.	ML leads to knowledge.