
Deep Learning for Artificial Intelligence

We can now notice that with a massive amount of computational power, machines can now recognize objects and translate speech in real time, with this we can say artificial intelligence is getting better and smarter. The adaptations of machines and software to learn in a very real sense to recognize patterns in the digital representation of sounds, images or any type of data. when machine learning has many techniques in it, Deep learning stands out as very important one. There are many definitions of Deep learning, my favorite one being the formal definition for deep learning by Analytics Vidhya is defined as “Deep learning is a particular kind of machine learning that achieves great power and flexibility by learning to represent the world as nested hierarchy of concepts, with each concept defined in relation to simpler concepts, and more abstract representations computed in terms of less abstract ones.”

Deep learning is a part of a family of machine learning, let's see how Deep learning came into existence and how it became more popular. As we know Machine learning uses algorithms to parse the data, memorizes it and learn from it, and then decide or prediction about the thing we are feeding the data in. It is very complex to hand code software with a specific set of instruction to accomplish a task in machine learning, so the machine is trained using copious amounts of data and algorithms that give it the ability to learn itself how to perform the task.

The human brain contains billions of neurons which communicate each other for information sharing. With the same idea, the artificial neurons are created for the machine to make think and act like our brain. Using the neurons neural networks were created, the logic was to replicate the human brain in a machine. The representation of the biological neuron is given in the below fig:

Machine learning directly enrooted from the minds who dreamt and gave birth of artificial intelligence. The logic was to replicate the human brain functionalities in the machine, so the concepts of neurons came into existence. The artificial neurons are represented as shown below:

The algorithmic approaches over the years included decision tree learning, inductive logic programming are very initial ones. And there are algorithms like clustering, reinforcement learning, and Bayesian networks. These algorithms did not satisfy in achieving the goal of general AI. As we go more in-depth we know that one of the most best-suited application areas for machine learning for many years was computer vision, and though it still required a great deal of hand coding to get achieve the task. Somewhere even it was lacking the accuracy as an example of reading and recognizing the object during a sunny day and a foggy day.

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These layers learn through the models called 'neural networks', which is structured in layers one after another. Deep learning is called an artificial neural network(ANN), that is a network formed inspired by biological neural networks which can be used to approximate functions which have an enormous number of inputs that are rarely known

The simple neural networks were lacking the accuracy, to make the system more robust and stronger in the aspect of human brain came to the multiple hidden layered networks called deep learning which is excellent till proven technique to implement machine learning. Most Deep learning methods use architecture as neural networks, so they are often referred to as a Deep neural network. The deep neural network is the name driven from the number of hidden layers in the network. The presentation of both simple and Deep learning is given in the fig.

Deep learning models are trained on large sets of classified data and neural network architectures that learn features directly from the data without the need for manual feature extraction. If we draw a graph showing how these concepts are built on top of each other, the graph is deep, with many layers. For this reason, we call this approach to AI deep learning.

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