

Deep Learning :

Deep learning is a subset of machine learning that uses neural networks with many layers to learn complex patterns from large amounts of data. It is especially useful for tasks like image recognition, speech processing & natural language understanding.

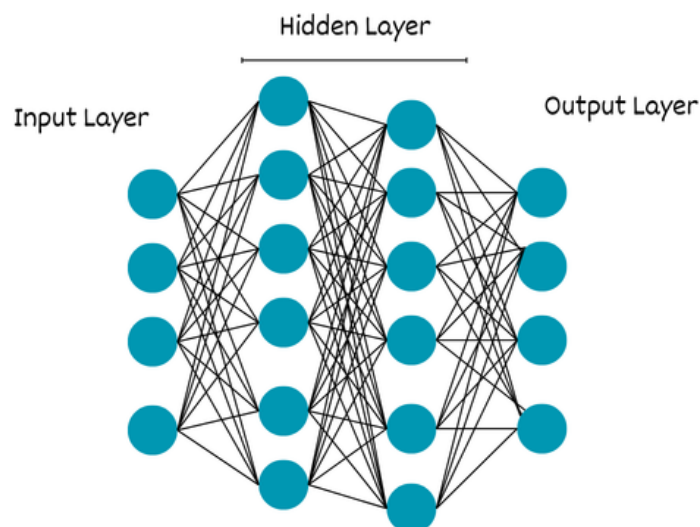
The concept of Deep learning is based on the concept of neurons that we humans have. Our body has a network of neurons which are tied to each other. Neurons are fundamental units of the brain, communicate with each other through a combination of electrical & chemical signals and send messages all over the body to allow us to do everything from breathing, to talking, walking, eating, thinking. Billions of neurons work together in layers to help you think, see, learn & decide.

Our body has a network of neurons. So when we see something from our eyes, these neurons send information from one to another & eventually it reaches to your brain and as the signal moves through deeper layers of the brain's visual system, neurons combine the basic features into patterns & finally your brain recognizes the object.

So we can say that neurons are like multiple layers with each one connected to the other & they are processing information, having multiple stages, transmitting info to the next stage, enhancing it. And that's why humans are so intelligent.

So engineers thought that let's apply this neuron concept to machine learning & that's where they created neural networks.

neural network is a computational model inspired by the structure & function of the human brain, used to solve complex problems



Neural Network are backbone of deep learning, a subset of machine learning
There are multiple layers & each layer is taking information from the previous layer, analyzing it, learning from it, enhancing it & passing it on to the next layer. So in this case accuracy on complex problems like text generation, image recognition, image generation improves significantly.

So machine learning is a broader field that includes traditional algorithms (like decision trees, SVM etc.) & advanced ones (like neural networks).

Deep learning is a subset of ML that uses neural networks with many layers (deep neural networks) & text generation relies heavily on deep learning models like RNN, Transformer.

So basically for complex problems like text generation, image generation neural network models outperform traditional machine learning models but training deep neural networks requires high computational power, high - end GPUs & lots of memory & training time can range hours to weeks.

Deep learning is a part of machine learning that helps computers learn & make decision by using neural networks - inspired by human brain

