



## Module 1

### what is Deep Learning ??

Deep Learning is a subfield of Machine Learning. With the help of Deep Learning we are trying to mimic our brain's neural networks. It gained massive attention in recent year by his performance in the field like image recognition, auto driving cars, NLP etc.

we'll take a journey through the history of deep learning, exploring its key milestones and the remarkable progress made in this field.

However, one must understand how deep learning has evolved over the years and formed the current models. The history of machine learning goes back to 300 BC, Aristotle and it is seen as starting point by Associationism (Wang & Raj, 2017).

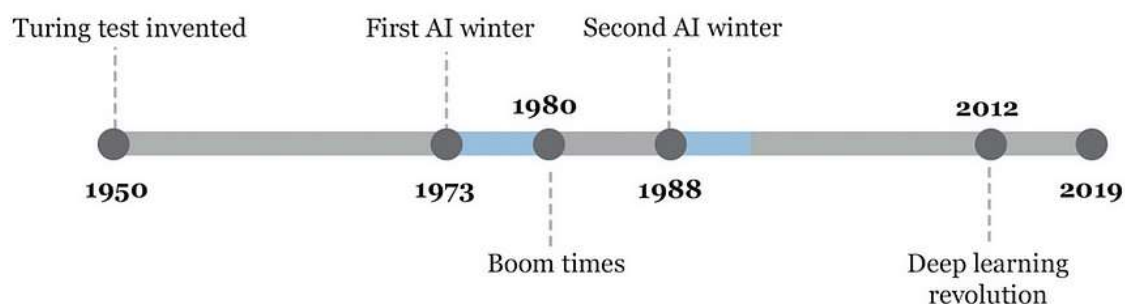
Year	Contributor	Contribution
300 BC	Aristotle	introduced Associationism, started the history of human's attempt to understand the brain.
1873	Alexander Bain	introduced Neural Groupings as the earliest models of the neural network, inspired Hebbian Learning Rule.
1943	McCulloch & Pitts	introduced the MCP Model, which is considered as the ancestor of the Artificial Neural Model.
1949	Donald Hebb	considered as the father of neural networks, introduced the Hebbian Learning Rule, which lays the foundation of modern neural network
1958	Frank Rosenblatt	introduced the first perceptron, which highly resembles modern perceptron.
1974	Paul Werbos	introduced Backpropagation
1980	Teuvo Kohonen	introduced Self Organizing Map
	Kunihiko Fukushima	introduced Neocogitron, which inspired Convolutional Neural Network
1982	John Hopfield	introduced Hopfield Network



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1985	Hilton & Sejnowski	introduced Boltzmann Machine
1986	Paul Smolensky	introduced Harmonium, which is later known as Restricted Boltzmann Machine
	Michael I. Jordan	defined and introduced Recurrent Neural Network
1990	Yann LeCun	introduced LeNet, showed the possibility of deep neural networks in practice
1997	Schuster & Paliwal	introduced Bidirectional Recurrent Neural Network

2009	Salakhutdinov & Hinton	introduced Deep Boltzmann Machines
2012	Geoffrey Hinton	introduced Dropout, an efficient way of training neural networks
2012+		Deep Learning Revolution started



### Origins of Neural Networks :

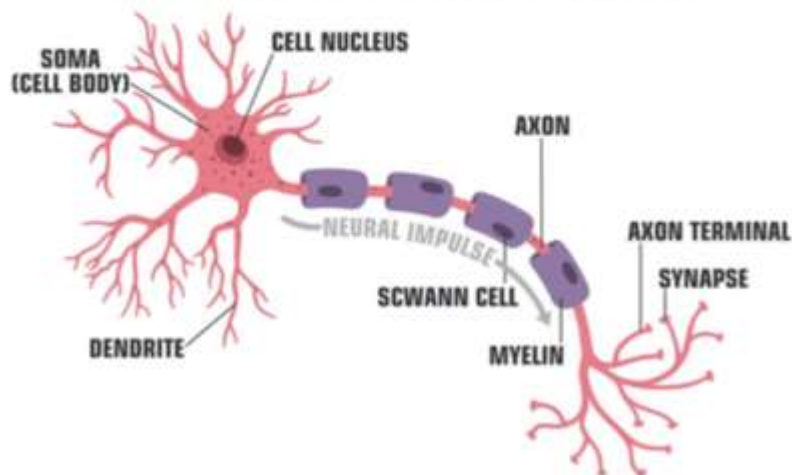
The evolution of deep learning started in 1940's 2 guys called Warren McCulloch and Walter Pitts proposed the concept of artificial neurons. They developed a mathematical model which based on the



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working of basic biological neuron. That artificial neuron is called Mcp-neuron. That laid the foundation for Deep Learning.

### STRUCTURE OF TYPICAL NEURON



### STRUCTURE OF ARTIFICIAL NEURON

