

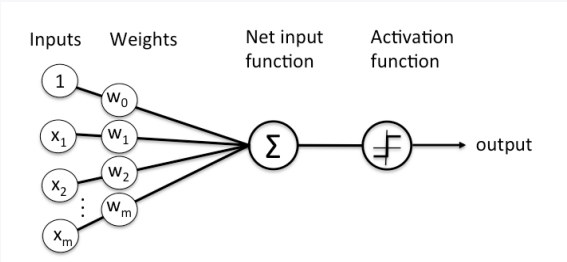
Neural Network

Definition

- 1 Algorithm Inspired by the structure of Human Brain, used for Recognizing the Pattern
- 2 Pattern are numerical contained in vectors into which real world data like Images, Text, Sound need to be Translated
- 3 Neural network is a set of neurons organized in layers, is learning how to classify an input through adjusting it's weights based on previous examples



Neuron



Neuron is a mathematical function that model the functioning of a biological neuron

Takes input, multiplies it by it's weights and then passes the sum through the activation function to the other neurons.



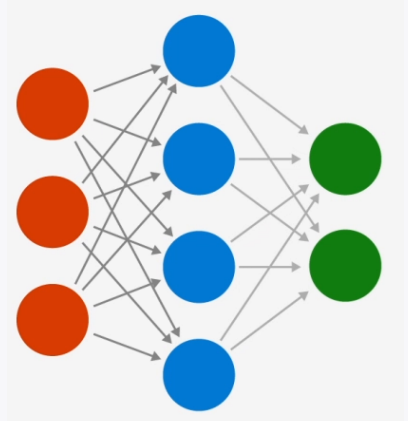
Elements

Weights

Numeric Values from Neural Networks, machine learns by itself. They self-adjust depending on the difference between predicted outputs vs training inputs.

Activation Function

It is a mathematical formula which helps the neuron to switch ON/OFF



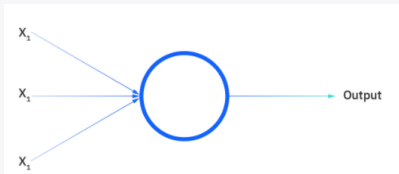
Layer

Layer is Made up of Nodes of Neuron & Weights

Input Layer

Hidden Layer

Output Layer

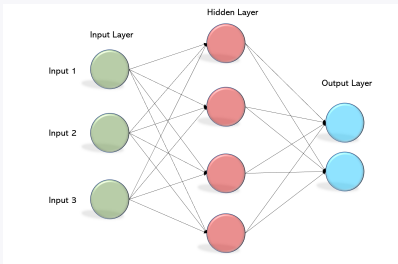


1 Perceptron

Structure

It is the simplest form of a neural network

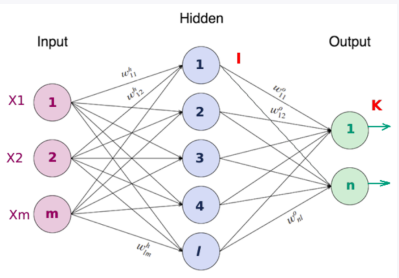
2 Multilayer Perceptron



Structure

MLP's decision function is a step function & Output is Binary

3 Feed Forward Neural Networks



Structure

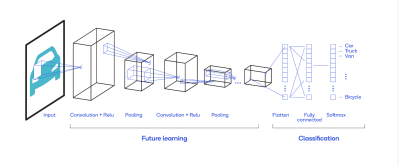
Simplest form of neural networks where input data travels in one direction only, passing through artificial neural nodes



3

Types

4 Convolutional Neural Network

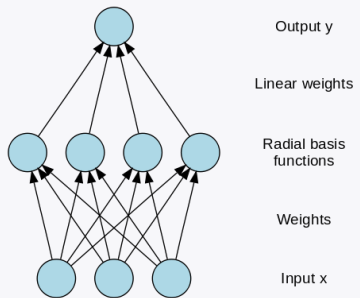


Structure

It contains a three-dimensional arrangement of neuron

Each neuron processes the information from a small part of the visual field

5 Radial Basis Function Neural Networks



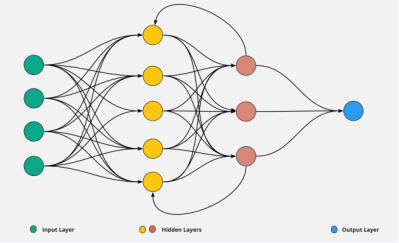
Structure

In Single Perceptron / Multi-layer Perceptron(MLP), we only have linear separability

It transforms the input signal into another form, which can be then feed into the network to get linear separability

It has exactly one hidden layer

6 Recurrent Neural Networks



Structure

It will remember the things from Previous input to generate output

Example

AND, OR functions are linearly-separable & XOR function is not linearly separable.