Tutorial 1

Artificial Intelligence: is the capability of a machine to imitate intelligent human behaviour.

Machine Learning: is the ability of computers to learn without being explicitly programmed.

Supervised Learning: it is an algorithm to learn the mapping function from input to output, given we have input and output variables.

Unsupervised Learning: is a training model using information that is neither classified nor labelled.

Class1 and class2 elements should have 1) High intra-class similarity

2) Low inter-class similarity

Reinforcement Learning: is a leaning by interacting with space or an environment.

A RL agent learns from the consequences of its action, rather than from being taught explicitly. It selects its action on basis of its past experience(exploitation) and also by new choices(exploration).

Limitations of Machine Learning:

1) Not useful when working with high dimensional data, that is where we have a large number of inputs and outputs.
2) Cannot solve crucial, AI problems like NLP, Image recognition etc.
3) Features extraction is a big challenge.

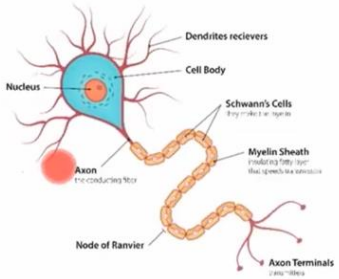
Deep Learning: is implemented using neural networks.

It is capable to focus on the right features by themselves, requiring little guidance from the programmer.

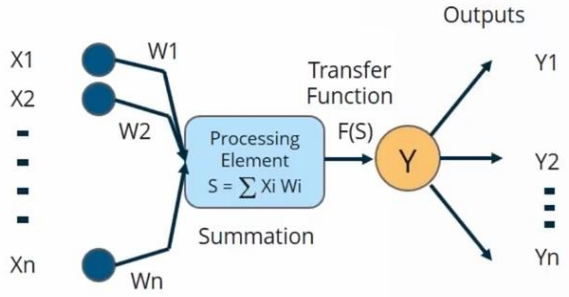
These models also partially solve the dimensionality problem.

Deep Learning To The Rescue

- ❑ Deep Learning is implemented through Neural Networks.
- ❑ Motivation behind Neural Networks is the biological Neuron.



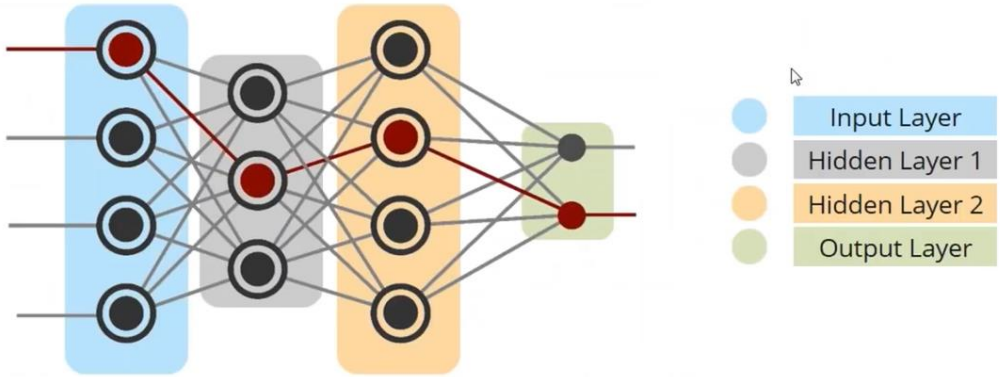
Neuron



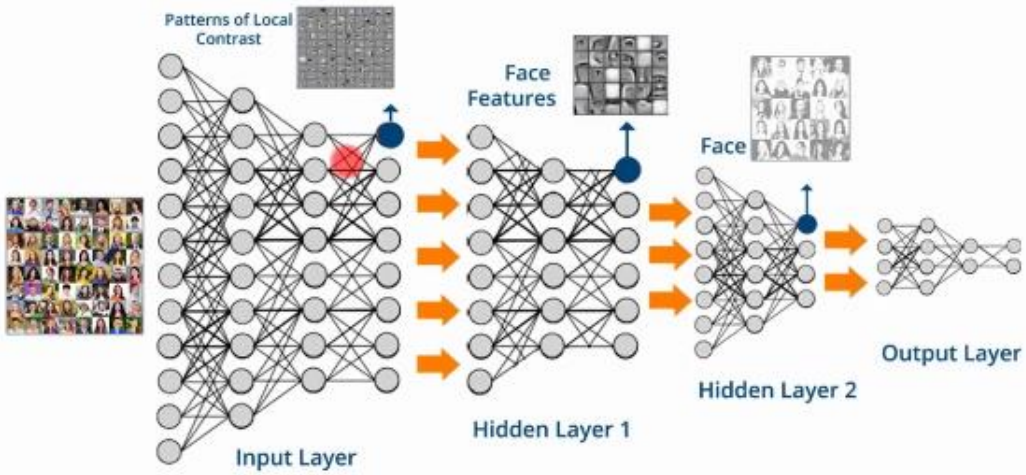
Artificial Neural Network

What Is Deep Learning?

A collection of statistical machine learning techniques used to learn feature hierarchies often based on artificial neural networks



Deep Learning Example



Deep Learning Applications

Self Driving Cars

Voice Controlled Assistance

Automatic Image Caption Generation

Automatic Machine Translation