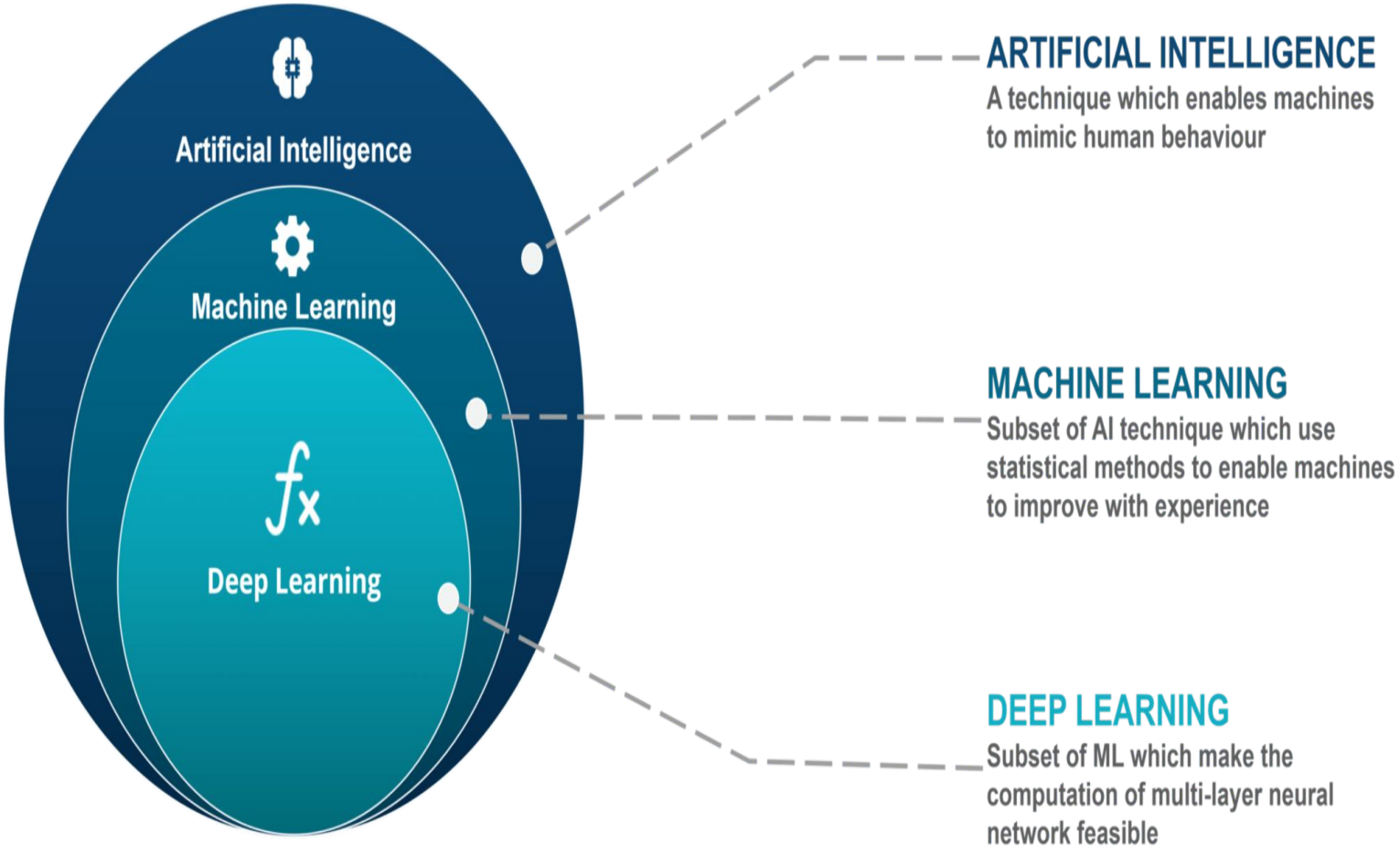
ML Vs DL Vs AI



Deep Learning is a subset of **Machine Learning** which is used to achieve **Artificial Intelligence**.

Deep Learning Vs Machine Learning

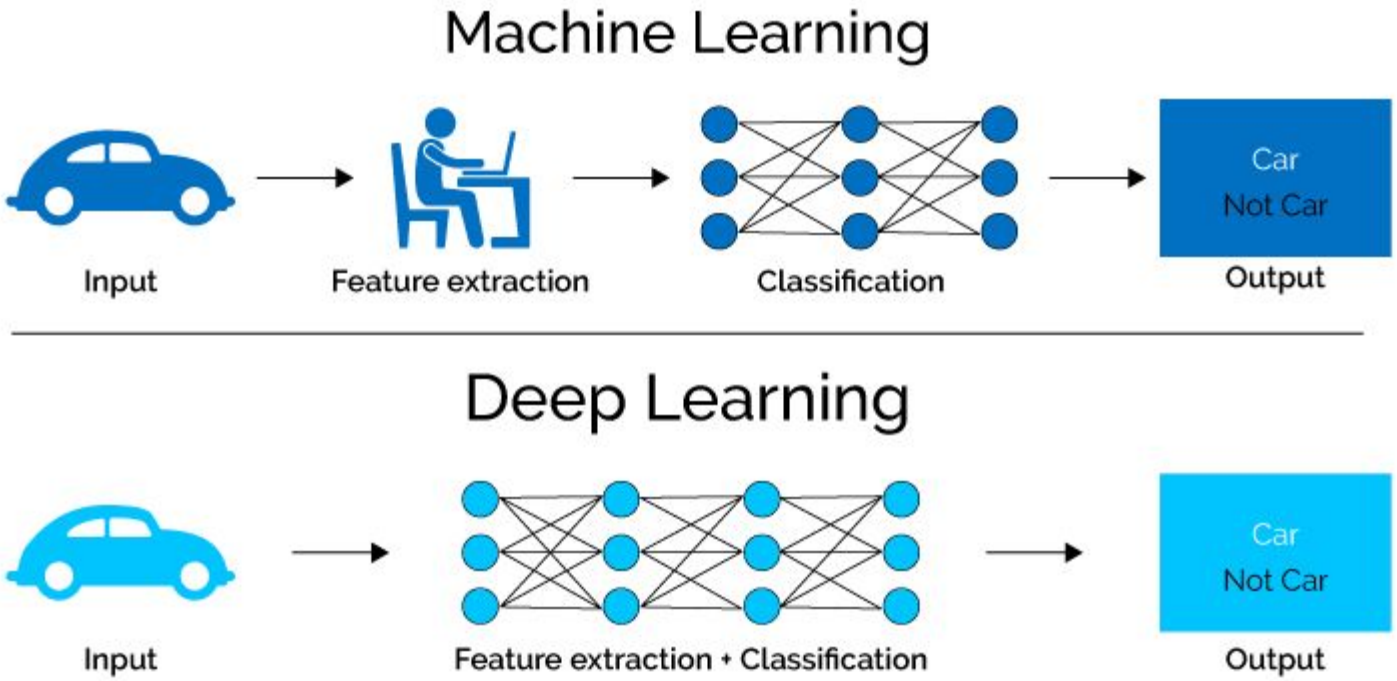
Factors	Deep Learning	Machine Learning
Data Requirement	Requires large data	Can train on lesser data
Accuracy	Provides high accuracy	Gives lesser accuracy
Training Time	Takes longer to train	Takes less time to train
Hardware Dependency	Requires GPU to train properly	Trains on CPU
Hyperparameter Tuning	Can be tuned in various different ways.	Limited tuning capabilities

Why deep learning

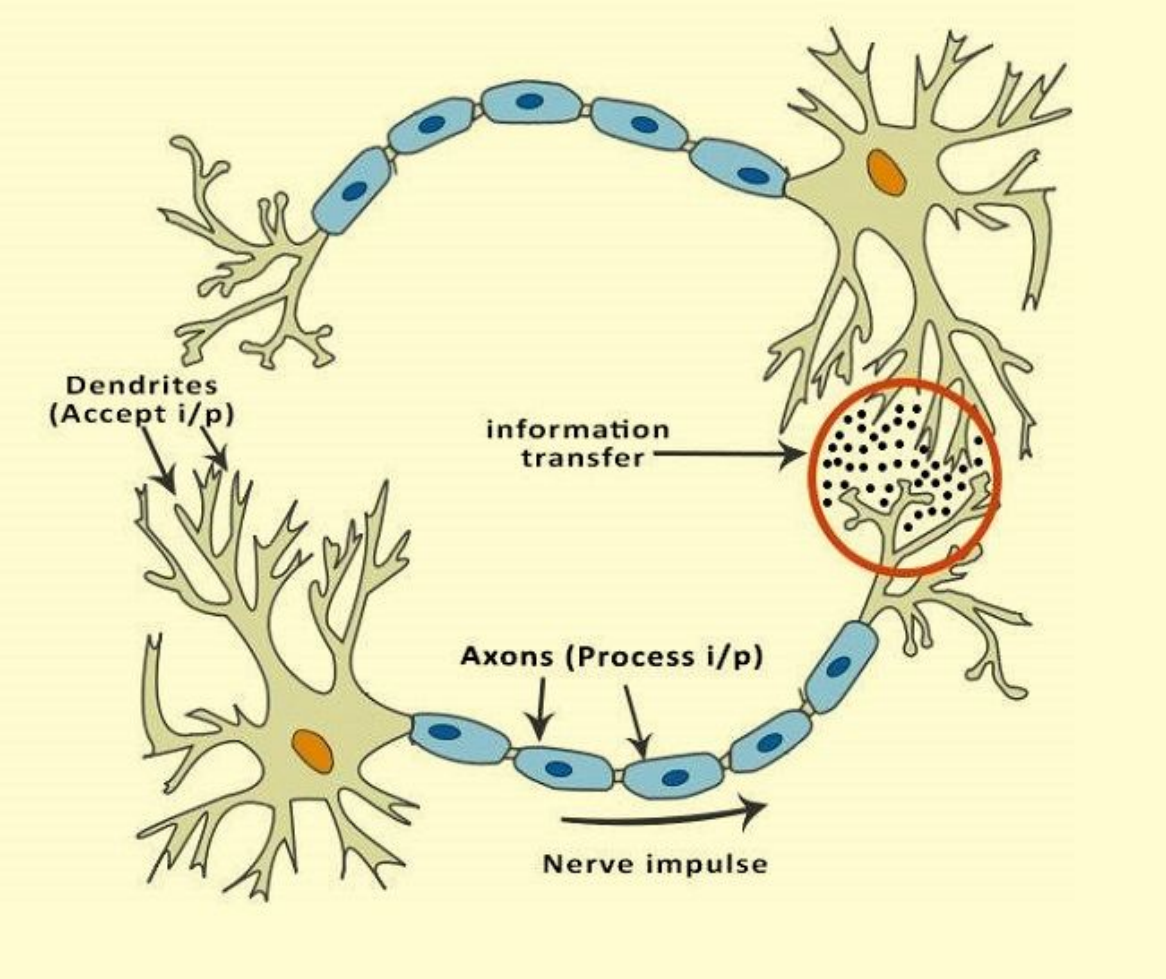
How do data science techniques scale with amount of data?

Deep Learning

- **Deep learning** is an AI function that mimics the workings of the human brain in processing data for use in detecting objects, recognizing speech, translating languages, and making decisions.
- **Deep learning** AI is able to **learn** without human supervision, drawing from data that is both unstructured and unlabeled.



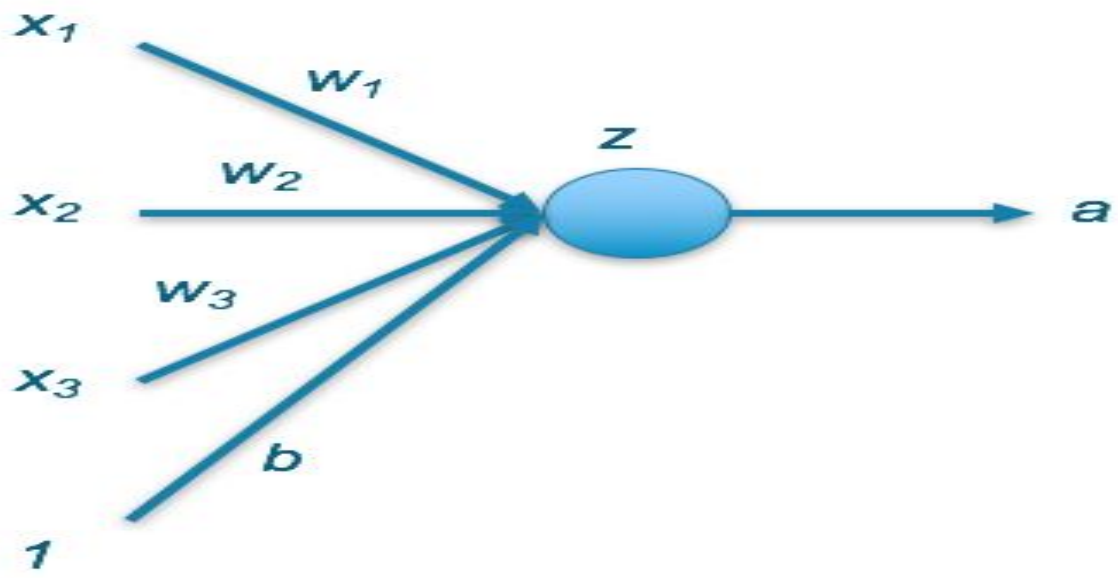
Neurons within the brain



A typical human brain has as many as 10B neurons!

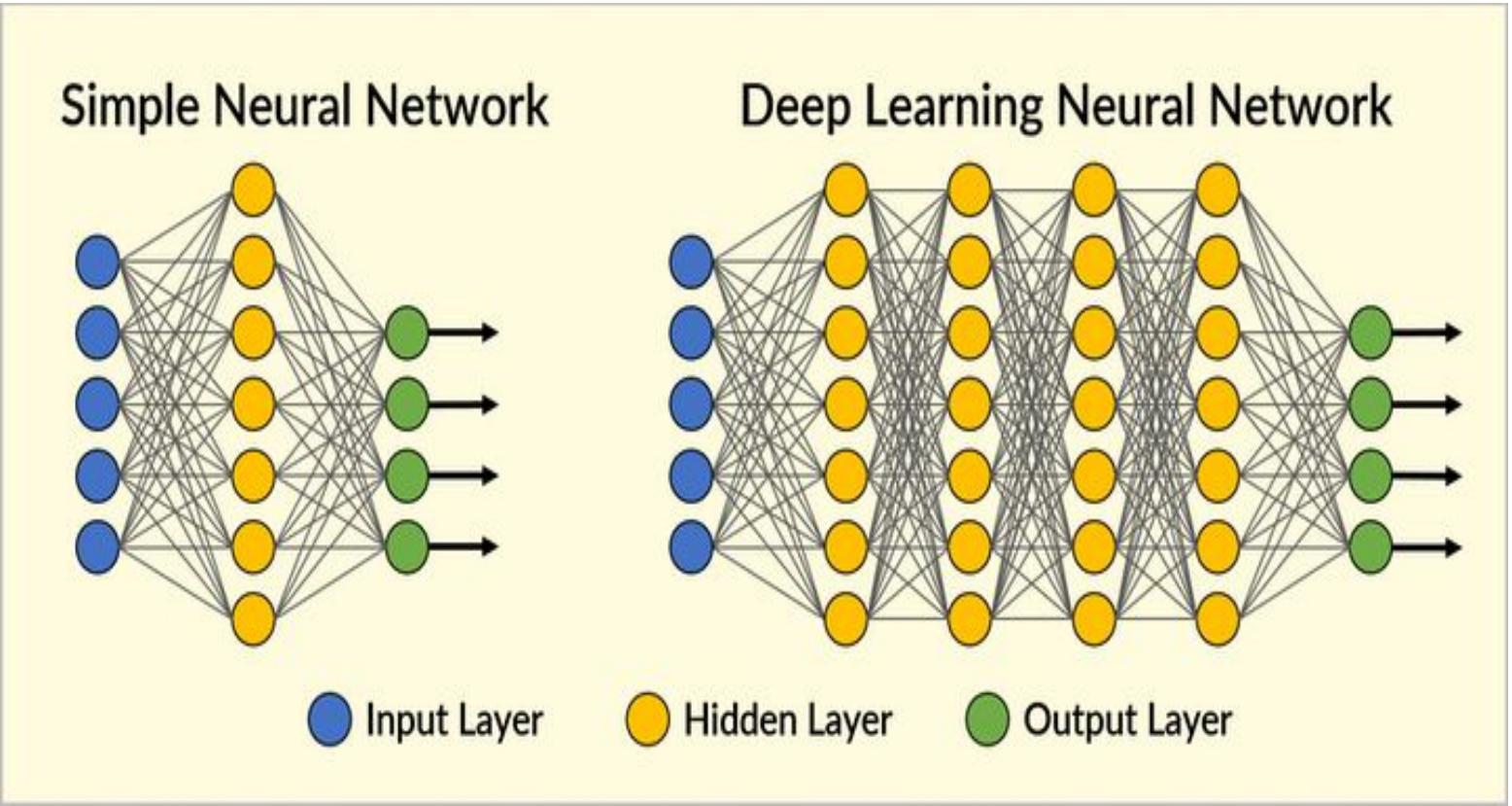
Artificial Neuron

- An artificial neuron (also referred to as a perceptron) is a mathematical function.
- It takes one or more inputs that are multiplied by values called “weights” and added together.
- This value is then passed to a non-linear function, known as an ***activation function***, for neuron’s output.



Artificial Neural Network

- Neural networks can learn complex patterns using layers of ***neurons*** which mathematically transform the data
- The layers between the input and output are referred to as "hidden layers"
- A neural network can learn relationships between the features that other algorithms cannot easily discover.



How Deep Learning works?

- The inspiration for deep learning is the way that the human brain filters information. Its purpose is to mimic how the human brain works to create some real magic.
- Deep Learning is a **machine learning** method. It allows us to train an AI to predict outputs, given a set of inputs. Both supervised and unsupervised learning can be used to train the AI.