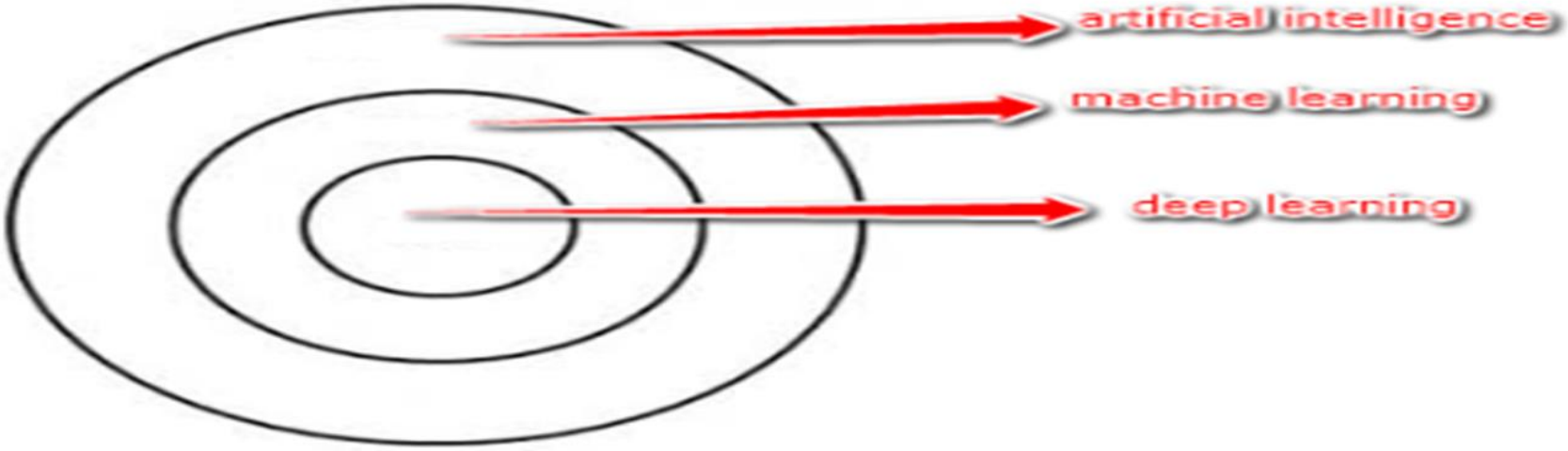
Artificial Intelligence, Machine Learning and Deep Learning concepts

Capgemini

Lesson Objectives

To understand the terminologies :
Machine-Learning(ML) and Deep-Learning(DL)
Supervised and Unsupervised Learning
Differences between ML and DL
Few applications of ML
ML and Big-Data

What is Machine Learning?



- Can be loosely interpreted to mean empowering computer systems with the ability to "learn"
- It is a method of training algorithms such that they can learn how to make predictions
- It can be broadly classified into "Supervised Learning" and "Un-Supervised Learning"

- Supervised-Learning involves providing training-data which is also known as “Labelled Data”
  - classification and regression are supervised learning problems
- Un-Supervised-Learning involves data which is “Un-Labelled Data”
  - clustering is an unsupervised learning problem

What is Deep Learning?

- DL is the next evolution of machine learning

- Roughly inspired by the information processing patterns found in the human brain

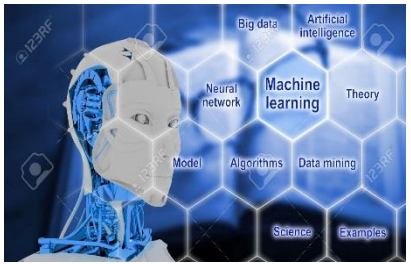
- Artificial Neural Networks(ANNs) are a type of infrastructure that aims to imitate the way our brains make decisions

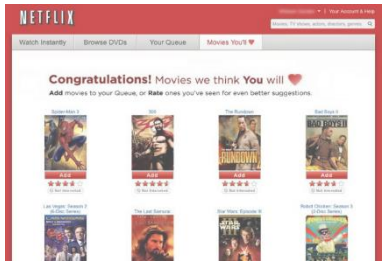
Machine Learning and Deep Learning comparison

Parameters	Machine Learning	Deep Learning
Data-Size	Works with large datasets	Suited for very large and complex datasets
Hardware	Works on normal CPUs	Works efficiently on GPUs for processing graphics/images/videos, TPUs
Feature engineering	Experts need to identify the features that would influence the final output	Impact of the features on the final output is judged by the system itself
Training time	From few seconds to few hours	From few hours to few weeks
Interpretability	It is easy to interpret the logic or reasoning behind the predicted results	It is difficult to impossible to interpret the logic or reasoning behind the predicted results because of the complexity of nodes and/or layers of nodes

Applications of Machine-Learning

- Virtual-Reality Headsets
- Facebook Facial-Recognition System
- Kinect Sports
- Speech-to-Text on I-phones
- Robot
- Recommendation-System
- Healthcare
- Space-Research





- Today we are living in the data-explosion era
- Continuous Data-generation
- Data is growing at a very fast rate and just keeps on growing exponentially with time
- ML algorithms need data to draw some value out of that data
- Hence, ML is becoming popular with data-explosion.

- The number of internet users in 2018 is **4.021 billion**
- The number of social media users in 2018 is **3.196 billion**
- The number of mobile phone users in 2018 is **5.135 billion**

- 130 EB of data till 2005 generated by human-beings
- In 2010, the figure rose to 1200 Exabytes.
- In 2015, it has become 7900 Exabytes of data.
- In 2020, the figure will be estimated to go upto 40900 Exabytes.

Thank You