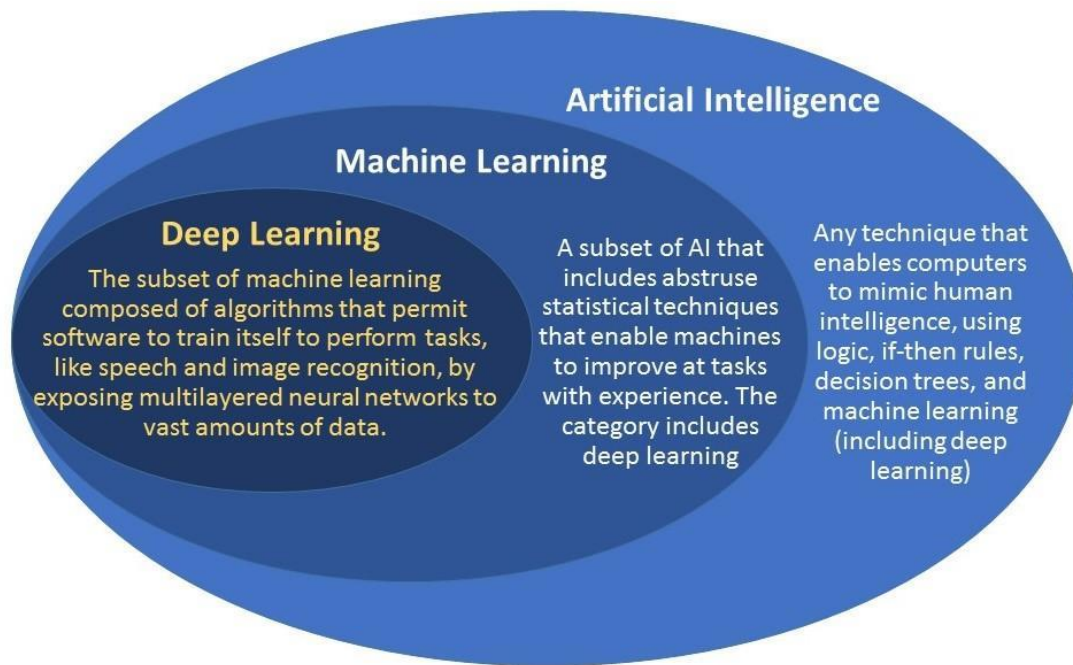


# Artificial Intelligence, Machine Learning, Deep Learning?

AI and machine learning are often used interchangeably, especially in the realm of big data. But these aren't the same thing, and it is important to understand how these can be applied differently.



## Artificial Intelligence

Artificial intelligence is a broader concept than machine learning, which addresses the use of computers to mimic the cognitive functions of humans. When machines carry out tasks based on algorithms in an “intelligent” manner, that is AI. It is any computer program that does something smart. It can be a stack of a complex statistical model or if-then statements. AI can refer to anything from a computer program playing chess, to a voice-recognition system like Alexa

## Machine learning

Machine Learning is a subset of AI. The theory is simple, machines take data and ‘learn’ for themselves. It is currently the most promising tool in the AI pool for businesses. Machine learning systems can quickly apply knowledge and training from large datasets to excel at facial recognition, speech recognition, object recognition, translation, and many other tasks. Machine learning allows a system to learn to recognize patterns on its own and make predictions, contrary to hand-coding a software program with specific instructions to complete a task.

***“That is, all machine learning counts as AI, but not all AI counts as machine learning.”***

Now, Next is Deep Learning. But before Deep Learning, we need to understand what is Neural Network

## Neural Network

Training computers to think like humans is achieved partly using neural networks. Neural networks are a series of algorithms modeled after the human brain. Just as the brain can recognize patterns and help us categorize and classify information, neural networks do the same for computers. The brain is constantly trying to make sense of the information it is processing, and to do this, it labels and assigns items to categories. When we encounter something new, we try to compare it to a known item to help us understand and make sense of it. Neural networks do the same for computers.

Benefits of neural networks:

- Extract meaning from complicated data
- Detect trends & identify patterns too complex for humans to notice
- Learn by example
- Speed advantages

## Deep Learning

Deep learning goes yet another level deeper and can be considered a subset of machine learning. The concept of deep learning is sometimes just referred to as "deep neural networks," referring to the many layers involved. A neural network may only have a single layer of data, while a deep neural network has two or more. The layers may be seen as a nested hierarchy of related concepts or decision trees. The answer to one question leads to a set of deeper related questions.

Deep learning networks need to see massive quantities of items in order to be trained. Instead of being programmed with the edges that define items, the systems learn from exposure to millions of data points.

Let's conclude this chapter by talking something about importance of data in our field

## Data is all that matter:

Whether you are using an algorithm, artificial intelligence, or machine learning, one thing is certain, data is most important. For a good system, good data is of utmost importance. If the data being used is flawed, then the insights and information extracted will be flawed. Decisions need to be based off clean and meaningful data. Thus, we need to preprocess the data to make it as flawless as possible.

**Data cleansing:** *"The process of detecting and correcting (or removing) corrupt or inaccurate records from a record set, table, or database and refers to identifying incomplete, incorrect or irrelevant parts of the data and then replacing, modifying or deleting the dirty or coarse data."*

Data scientists spend most of their time cleansing data — and surprisingly this is also their least favorite part of their job. Despite this, it is also the most important part, as the output can't be trusted if the data hasn't been cleansed.