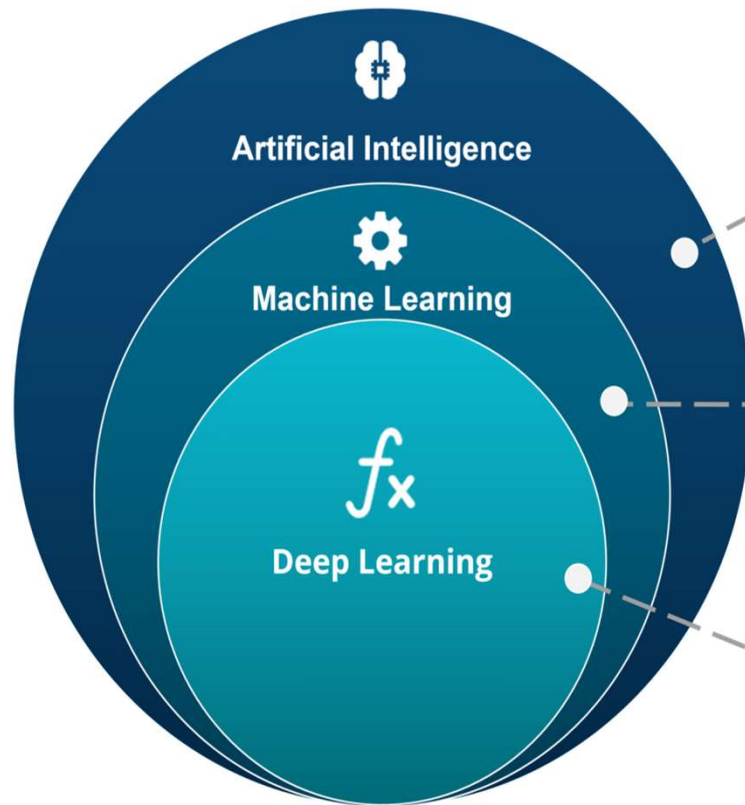


AI, ML & Deep learning Introduction

- Artificial Intelligence is the broader umbrella under which Machine Learning and Deep Learning come.
- And you can also see in the diagram that even deep learning is a subset of Machine Learning.
- **So all three of them AI, machine learning and deep learning are just the subsets of each other.**





ARTIFICIAL INTELLIGENCE

A technique which enables machines to mimic human behaviour

MACHINE LEARNING

Subset of AI technique which use statistical methods to enable machines to improve with experience

DEEP LEARNING

Subset of ML which make the computation of multi-layer neural network feasible



- **AI has become more popular these days why?** Well, it's because of the tremendous increase in data volumes, advanced algorithms, and improvements in computing power and storage.
- The data we had was not enough to predict the accurate result. But now there is a tremendous increase in the amount of data. Statistics suggest that By 2020, the accumulated volume of big data will increase from 4.4 zettabytes to roughly 44 zettabytes or 44 trillion GBs of data.
- Now we even have more advanced algorithms and high end computing power and storage that can deal with such large amount of data. As a result, it is expected that 70% of the enterprise will implement AI over the next 12 months, which is up from 40% in 2016 and 51% in 2017.

What is Artificial Intelligence?

- Artificial Intelligence is a technique which allows the machines to act like humans by replicating their behavior and nature.
- Artificial Intelligence makes it possible for the machines to learn from their experience.
- The machines adjust their response based on new inputs thereby performing human-like tasks by processing large amounts of data and recognizing patterns in them.



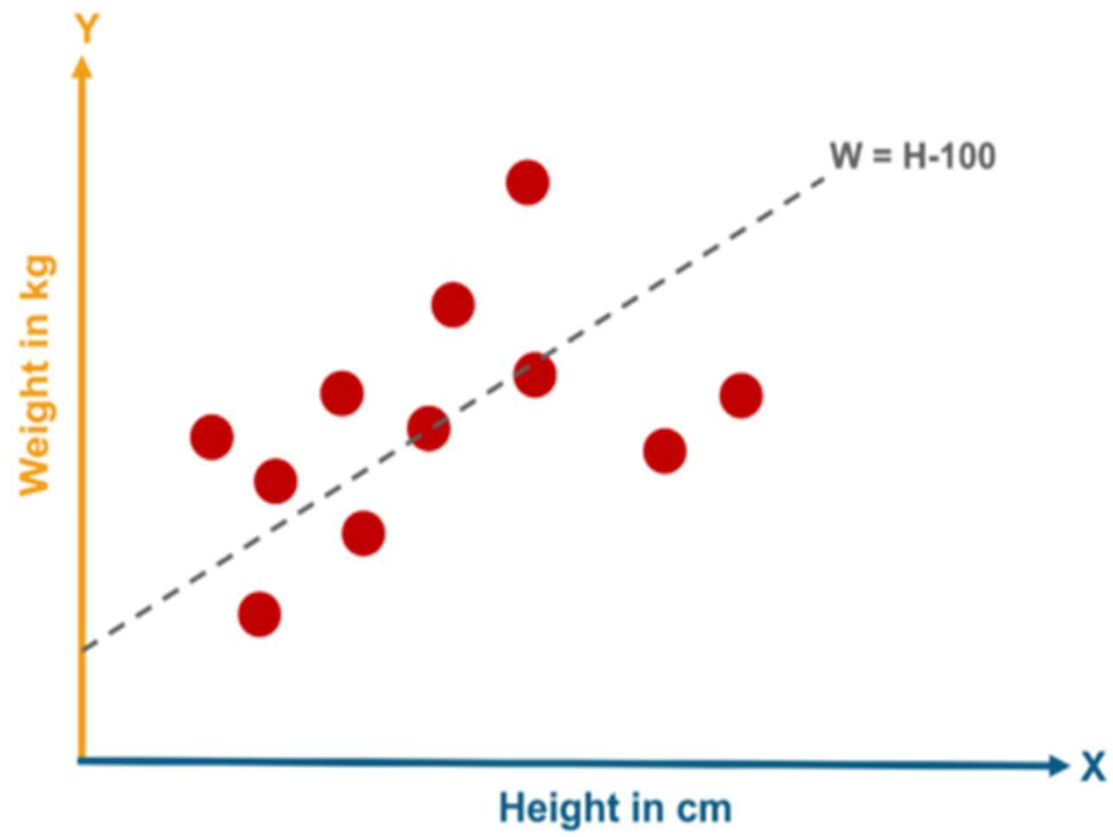
- Some of the examples of Artificial Intelligence from our day to day life are Apple's Siri, the chess-playing computer, tesla's self-driving car and many more.
- These examples are based on deep learning and natural language processing.



What is Machine Learning?

- Machine Learning is a subset of artificial intelligence.
- It allows the machines to learn and make predictions based on its experience(data)
- Let's say you want to create a system which could predict the expected weight of a person based on its height. The first thing you do is collect the data.
- Let us say this is how your data looks like:





- Each point on the graph represents one data point. To start with we can draw a simple line to predict the weight based on the height. For example, a simple line:

$$W = H - 100$$

- Where W is weight in kg and H is height in cm
- This line can help us to make predictions.
- Our main goal is to reduce the difference between the estimated value and actual value.
- So in order to achieve it, we try to draw a straight line that fits through all these different points and minimize the error and make them as small as possible.



- Decreasing the error or the difference between the actual value and the estimated value increases the performance.
- Further, the more data points we collect, the better will our model become.
- We can also improve our model by adding more variables (e.g. Gender) and creating different prediction lines for them.
- Once the line is created, so in future, if a new data (for example height of a person) is fed to the model, it would easily predict the data for you and will tell his predicted weight.



What is Deep Learning?

- Deep learning is a particular kind of machine learning that achieves great power and flexibility by learning to represent the world as nested hierarchy of concepts or abstraction
- The concept of deep learning is not new. But recently its hype has increased, and deep learning is getting more attention.
- This field is a special kind of machine learning which is inspired by the functionality of our brain cells called artificial neural network.



- It simply takes data connections between all artificial neurons and adjusts them according to the data pattern.
- More neurons are needed if the size of the data is large.
- It automatically features learning at multiple levels of abstraction thereby allowing a system to learn complex functions mapping without depending on any specific algorithm.



Example -1

- Let us try and understand how you recognize a square from other shapes.



- Sides = 4 ✓
- Closed ✓
- Perpendicular ✓
- Equal Sides ✓

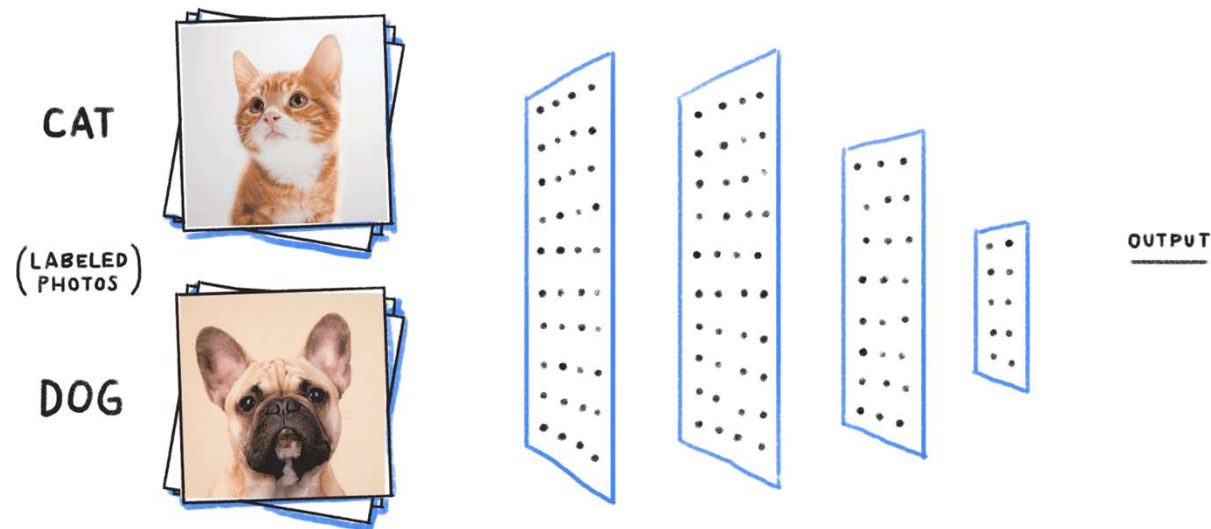


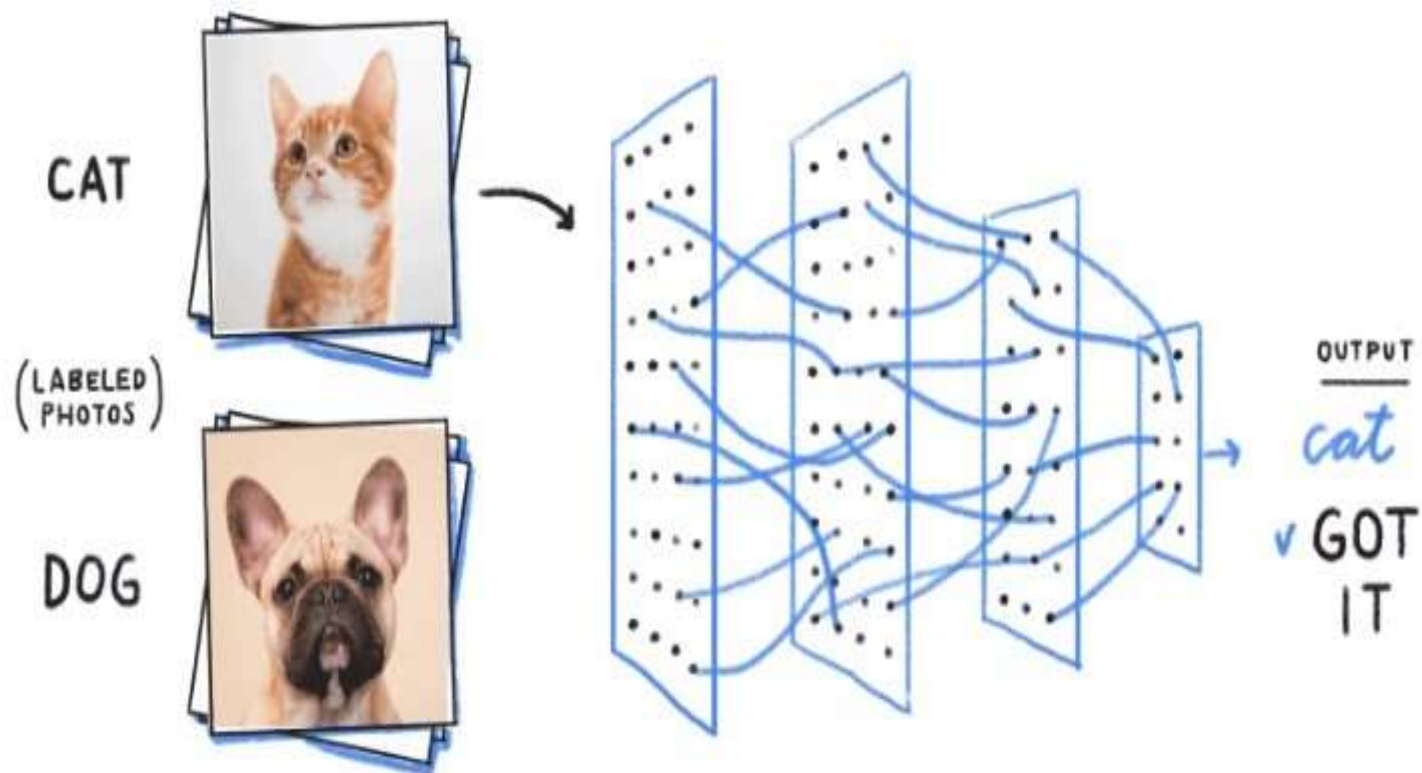
- The first thing is to check whether there are 4 lines associated with a figure or not (simple concept right!).
- If yes, we further check, if they are connected and closed, again if yes we finally check whether it is perpendicular and all its sides are equal (Correct!).
- Well, this nothing but a **nested hierarchy of concept**.
- What we did, we took a complex task of identifying a square in this case and broke it into simpler tasks.
- Now, this Deep Learning also does this but on a larger scale.



Example - 2

- Let's take an example of a machine which recognizes the animals. The task of the machine is to recognize whether the given image is of a cat or of a dog.





- **In short**, we will define the facial features and let the system identify which features are more important in classifying a particular animal.
- Now when it comes to deep learning.
- It takes this to one step ahead. Deep Learning automatically finds out the features which are important for classification, comparing to Machine Learning where we had to manually give the features.



Why AI and IoT are complementary ?

- Let's take a closer look at industries and businesses that have already managed to cut costs, create a better user experience and open up new business models with AI in IoT.
- Perhaps, these examples will make you consider implementing AI and IoT in your business.



Industrial Internet of Things (IIoT)

- The widespread use of IoT devices with industrial equipment provides a plethora of data.
- With AI algorithms applied to the gathered data, business owners can detect potential issues, fix them in advance and apply these insights to other cases.
- The system is gradually taught to recognize external and internal factors that have an impact on the operation of the machines.
- By optimizing resources and increasing industrial safety, the entire production process is streamlined.



- **Predictive maintenance** is the brightest showcase of AI used in IIoT.
- **Predictive or perspective maintenance** means that a system powered by the machine learning algorithms can predict a need for maintenance on a plant floor.
- On top of that, artificial intelligence can help in creating self-healing and self-calibrating IoT devices like sensors, inductors or transmitters.
- The biggest benefits that AI adds to the IIoT due to the described capacities are the reduction of maintenance costs and downtime.



Healthcare

- The healthcare industry generates showers of data.
- Sensors from medical devices, healthcare mobile apps, fitness trackers and digital medical records have been producing and collecting patients data for years.
- The AI and IoT approach can help predict diseases, suggest preventive maintenance and provide drug administration.
- When it comes to health protection or disease control, patients and hospitals would welcome the benefits that come with the AI and IoT approach.



Smart Home

- According to IDC, consumers will make more investments in smart home ecosystems to the tune of \$63 billion by 2020.
- Will there be a place for artificial intelligence at home which is “smart” enough already? We bet it will.
- Artificial intelligence means even bigger automation in a smart home.
- Since the entire idea of connected objects is to make a life easier, more automation sounds great.
- On top of that, AI can make life in smart homes even more pleasant.



THE ROLE OF AI AND IOT IN FUTURE OF INSURANCE INDUSTRY

- Machine learning matched with complex AI algorithms hold the capacity to totally change the intents and purposes of any industry.
- Most definitely, the insurance industry isn't a special case.
- AI and IoT are already shaping the insurance industry.
- Let's look at how AI and IoT will help shape the insurance industry in the future.



Data Explosion from Connected Devices

- In industrial settings, tools with sensors have been omnipresent for quite a while, yet the coming years will see an enormous increment in the number of connected consumer devices.
- The infiltration of existing gadgets, for example, vehicles, fitness trackers, home assistants, cell phones, and smartwatches will keep on expanding quickly, joined by new, developing classifications, for example, apparel, eyewear, home appliances, medical gadgets, and shoes.



- The subsequent torrential slide of new data made by these gadgets will enable bearers to comprehend their customers all the more deeply, bringing about new product classifications, more customized pricing, and growingly real-time service delivery.



Risk Assessment and Big Data

- Most of the leading insurance agencies are blending their data analytics algorithms with probably the most recent AI innovation so as to enhance the precision of risk calculations.
- The explanation behind this is that insurance agencies need huge amounts of information so as to enhance their appreciation of customer hazard.



Physical Robots

- The field of robotics has seen many energizing accomplishments as of late, and this development will keep on changing how people collaborate with their surroundings.
- Additive manufacturing, otherwise called 3-D printing, will drastically reshape manufacturing and the insurance products in the commercial markets in the near future.



- By 2025, 3-D-printed structures will be normal, and transporters should survey how this advancement changes risk evaluations.
- What's more, programmable, self-ruling drones; self-driving vehicles; self-ruling farming gear; and enhanced surgical robots will all be financially practical in the following decade.



Digital Transformations

- It is stupid to disregard the impacts that AI will have on the insurance business.
- They will be very like automation in the car industry.
- Numerous parts of insurance will never again be done by people.
- As this progress unfurls with AI and connectivity prompting to autonomous vehicles at some point during the 2020s, the insurance business and numerous others will be compelled to advance and adjust to new realities, for example, fewer mishaps and even better approaches for deciding who is at fault.

