**slide: 6**

**What is Machine Learning?**

* Well, Machine Learning is a concept which allows the machine to learn from examples and experience, and that too without being explicitly programmed. So instead of you writing the code, what you do is you feed data to the generic algorithm, and the algorithm/ machine builds the logic based on the given data.
* Google says "Machine Learning is the future," and the future of Machine Learning is going to be very bright. As humans become more addicted to machines, we’re witnesses to a new revolution that’s taking over the world, and that is going to be the future of Machine Learning.
* Here examples means data
* Every day 2.5 Exabytes (or 250 crores gigabytes), this boost the ml & ai

**slide:7**

**Features of Machine Learning**

1. It uses the data to detect patterns in a dataset and adjust program actions accordingly
2. It focuses on the development of computer programs that can teach themselves to grow and change when exposed to new data.
3. It enables computers to find hidden insights using iterative algorithms without being explicitly programmed
4. Machine learning is a method of data analysis that automates analytical model building

**slide:8**

**Future of Machines**

* In today’s world, these machines or the robots have to be programmed before they start following your instructions. But what if the machine started learning on their own from their experience, work like us, feel like us, do things more accurately than us? These things sound fascinating, Right? Well, just remember this is just the beginning of the new era.
* A normal human brain capable to storage 2.5 petabytes (or a million gigabytes), wherein the machine have no limitation on storage.

**slide:9**

**Biggest Confusion: AI vs ML vs DL**

* AI: programs with the ability to learn new things and response like human.
* ML: Algorithms with the ability to learn without being explicitly programmed
* Deep Learning: Neural Network are inspire by the human brain.

neurons -> a thing that holds a number specifically (o-1)

0 for black pixel and 1 for white pixel,

Number between the neurons called “Activation”

Play the neural\_networks.mp4 video

**slide:10**

**First neural network**

The first step toward artificial neural networks came in 1943 when **Warren McCulloch**, a neurophysiologist, and a young mathematician, **Walter Pitts**, wrote a paper on how neurons might work. They modeled a simple neural network with electrical circuits.

**slide:11**

It’s a very high level of Machine Learning model.

**slide:12**

## Types of Machine Learning

Machine learning is sub-categorized to three types:

* **Supervised Learning – Train Me!**
* **Unsupervised Learning – I am self sufficient in learning**
* **Reinforcement Learning – My life My rules! (Hit & Trial)**

**slide:15**

## What is Supervised Learning?

Supervised Learning is the one, where you can consider the learning is guided by a teacher. We have a dataset which acts as a teacher and its role is to train the model or the machine. Once the model gets trained it can start making a prediction or decision when new data is given to it.

**slide:16**

## What is Unsupervised Learning?

The model learns through observation and finds structures in the data. Once the model is given a dataset, it automatically finds patterns and relationships in the dataset by creating clusters in it. What it cannot do is add labels to the cluster, like it cannot say this a group of apples or mangoes, but it will separate all the apples from mangoes.

Suppose we presented images of apples, bananas and mangoes to the model, so what it does, based on some patterns and relationships it creates clusters and divides the dataset into those clusters. Now if a new data is fed to the model, it adds it to one of the created clusters.

**slide:19**

## What is Reinforcement Learning?

It is the ability of an agent to interact with the environment and find out what is the best outcome. It follows the concept of hit and trial method. The agent is rewarded or penalized with a point for a correct or a wrong answer, and on the basis of the positive reward points gained the model trains itself. And again once trained it gets ready to predict the new data presented to it.

**slide:20**

**Example of Reinforcement Learning**

AlphaGo

In March 2016, it beat **Lee Sedol** in 4/5 game match.

In 2017, its beat **Ke Jie**, the world No. 1 Ranked player in 3/3 game match.

**slide:21**

**Algorithms of Machine Learning**

Some of the most popular machine learning algorithms are:

In Supervised: Linear Regression, Decision Tree, Random forest & Classification KNN

In Clustering, Association analysis & Hidden Markov Model

**slide:22**

**Applications of Machine Learning**

1. Travel: Dynamic pricing (uber or ola)
2. Marketing:
3. Healthcare: Detecting Breast Cancer & Eye dieses.
4. Social Media: Digital Marketing
5. Sales: Discount offering & Demand forecasting
6. Automation: Self driving car, pilotless aircraft & drones
7. Credit & Insurance: fraud detection & claim prediction

Play the drones video

**slide:23**

Self-explanation.

Play the KUKA Videos

**slide:24**

Self-explanation.

Play the moley Video

**slide:25**

Self-explanation.

Play the TESLA Video

Tata motors working hard to give India’s first selfdriving car.

Tata Nano Autonomous – India’s first driverless car! Made by Anil George

**slide:26**

Query: Make me a haircut appointment on Tuesday morning anytime between 10 to 12

Play the Google Duplex Video

**slide: 27**

**Faster Route Selection**

Google Maps- The app which we use every time we go out.

Despite of the usual traffic, you are on the fastest route.

Everyone who is using the Google Maps is contributing in making the app more accurate

**slide: 28**

How does Netflix generates a list of movies similar to your interest?

75% of users selects movies based on Netflix’s Recommendation

**slide: 29**

Recommends ads based on your search history

Machine learning is used in generating recommendation

35% of Amazon’s revenue is generated by its recommendation system

**slide:34**

**Examples of CRM with AI & ML**

It’s no surprise that some of the biggest names in CRM Companies like: Salesforce, SugarCRM, Zoho and MicroSoft have all integrated some form of AI into their platforms over the last few years.

Play the Salesforce video

**Salesforce:** Salesforce’s AI tool is called [Einstein](https://www.salesforce.com/products/einstein/overview/). Billed as a tool that “… is a layer of artificial intelligence that delivers predictions and recommendations based on your unique business processes and customer data.”

Einstein can be integrated into every facet of the Salesforce CRM platform. It will cost businesses an additional $50 per user, per month.

Play the SugarCRM video

**SugarCRM:** SugarCRM has recently launched an AI product called Hint. Their pitch is that with just a name and email address, “Hint automatically searches, tunes, and inputs helpful personal and corporate profile details about your prospect. Results appear in seconds.”

Enabling Hint will cost SugarCRM users an additional $15 per user, per month.

Play the ZIA video

**Zoho:** Zoho offers a “conversational AI assistant” called [Zia](https://www.zoho.com/crm/zia-voice.html). Similar to the voice assistants built into most smartphones, but focused on CRM, “Zia is here to assist with everything from simple data to complex analytics. Talking to Zia is as simple as chatting with her from the bottom of your desktop screen, or calling her from your mobile app.”

Zia Voice is only included in Zoho CRM plans at the two highest tiers, which start at $35 per user, per month.

Play the layout video

**Microsoft:** No sooner did we publish this post than [Microsoft announced](https://blogs.microsoft.com/blog/2018/09/18/announcing-new-ai-and-mixed-reality-business-applications-for-microsoft-dynamics/)new AI and mixed reality business applications for Microsoft Dynamics.

**slide: 36**

**TensorFlow:**

An open source machine learning framework for everyone.

since TensorFlow is open source there are a lot additional language choices communities support being added all the time

TensorFlow since it's release (First released Nov 2015)

#1 repository in "machine learning" category on GitHub

Great for Deep Learning in particular

Standard software for general machine learning.

Concept heavy, but code light. many parameters, but good defaults. Only a few are important to adjust.

TensorFlow is a fast, flexible, and scalable open-source machine learning library for research and production.

**Keras:**

Keras is a high-level neural networks API, written in Python and capable of running on top of [TensorFlow](https://github.com/tensorflow/tensorflow)

**Scikit-learn:**

Scikit-learn is a free software machine learning library for the Python programming language. It features various classification, regression and clustering algorithms including support vector machines, [random forests](https://en.wikipedia.org/wiki/Random_forests" \o "Random forests), [gradient boosting](https://en.wikipedia.org/wiki/Gradient_boosting) & [*k*-means](https://en.wikipedia.org/wiki/K-means_clustering)

**Python:**

if you are interested you can try out TensorFlow in probably everyone favorite language right now Python 3

**slide: 38**

**IMAGENET**

Imagenet is an open source image database.

Identify and label objects in images and video

since it's launch in 2009 having 15M images & 22,000 categories.

they use crowd sourcing technology like Amazon Mechanical Turk platform

48,940 workers from 167 countries is around the world,

help them to clean sort & label those images

which becomes rocket fuel for the ML engine.

as an eg in the case of cats

they have more than 62,000 cats of all kinds of looks, poses and the across all species of domestic and wild cats

**slide: 44**

Connected to "Python 2 & 3 Google Compute Engine backend(CPU/GPU/TPU)"

CPU : RAM: 12.72 GB Disk: 48.27 GB

GPU : RAM: 12.72 GB Disk: 358.27 GB

TPU : RAM: 12.72 GB Disk: 48.97 GB

Free ML course

1. Google https://ai.google/education/

2. Coursera https://www.coursera.org/learn/machine-learning

3. EDX https://www.edx.org/course/machine-learning

Paid ML course

4. Udacity

2. Edureka

3. SimpleLearn

4. UpGrad

**slide: 45**

Radiologist : a person who uses X-rays or other high-energy radiation espesically a doctor specializing in radiology.

Hematologist: the branch of medicine involving study and treatment of the blood.

Columnist : a journalist contributing regularity to a newspaper or magazine.

Economist : an expert in economics