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Monthly serving of latest technical news

EXPERT COLUMN

Technology Is Now A Stickman
by Mr Siddhartha Mukherjee

LET US EXPLORE

Machine learning- Types of Algorithms, Applications and more

QUIZ TIME

Monthly edition of audience favourite quiz is back

OCTOBER 2021 EDITION

HAPPENNINGS @SSA

The Srians were busy with the first terminal examinations that commenced at the beginning of September. Two of the students **Mitadru Dasgupta and Rishav Majumdar of 9th grade** participated in the **Global Conference on Artificial Intelligence and Applications (GCAIA)** presented their research paper titled-

"IoT Based Smart City for the Post Covid-19 World: a Child-Centric Implementation Emphasis on Social Distancing"

However, it was a proud moment for SSA as their paper got accepted in this international conference where they have competed with Students pursuing graduation in engineering and managed to bag the **Best Paper Award**.

It happened probably for the first time in Eastern India that school students below the 10th grade presented a paper in an international conference and got their paper published along with the Best Paper Award.

Technology is Now Really a Stickman

Sidhartha Mukherjee

Former Executive Director of Human Resource at a Fortune 500 company

Has Technology replaced love as the glue which binds the world together? Well, it seems so. If we were to look at the field of education, gaming and schooling have always gone hand in hand. But today this has taken a new dimension altogether. Even in early 2019, no one believed that schooling was anything but being cooped up in a building for a number of hours. In came Covid and changed the rules. Today, everyone can be a Mark Twain and say "I have never let my schooling interfere with my education". Schools have been liberated, confinement is no longer the norm and several choices have emerged. Not surprisingly, Technology has moved from being a mere handmaiden to the prime driver in the field of education.

The changes in the education sector has been fast and furious. Faced with movement restrictions, web based education has taken centre stage, ushering in democratization of education. In the process, no longer can the Ivy League Institutions, Oxford, Cambridge, IITs, IIMs, Presidency, MCC, St. Stephens or other elite establishments hold sway. All students now have similar access to On Line Learning platforms and Open Access Systems. Radical changes in the environment have made governments to stand up and take notice and new education policies are following

thick and fast. It's also a fact that in countries like India with large populations services are stretched; resulting in unfortunately skewed delivery systems. Parents, Pupils, Teachers and Educators are confounded and quick fix solution providers are making a killing. The IT Industry is obsessed with pushing proprietary technologies with an eye on maximizing profits. Till there is some sort of standardization and total solutions are provided, fragmented, domain oriented, monopolized approaches will temporarily rule the roost. In such a milieu, what are the options available to a common student or parent?

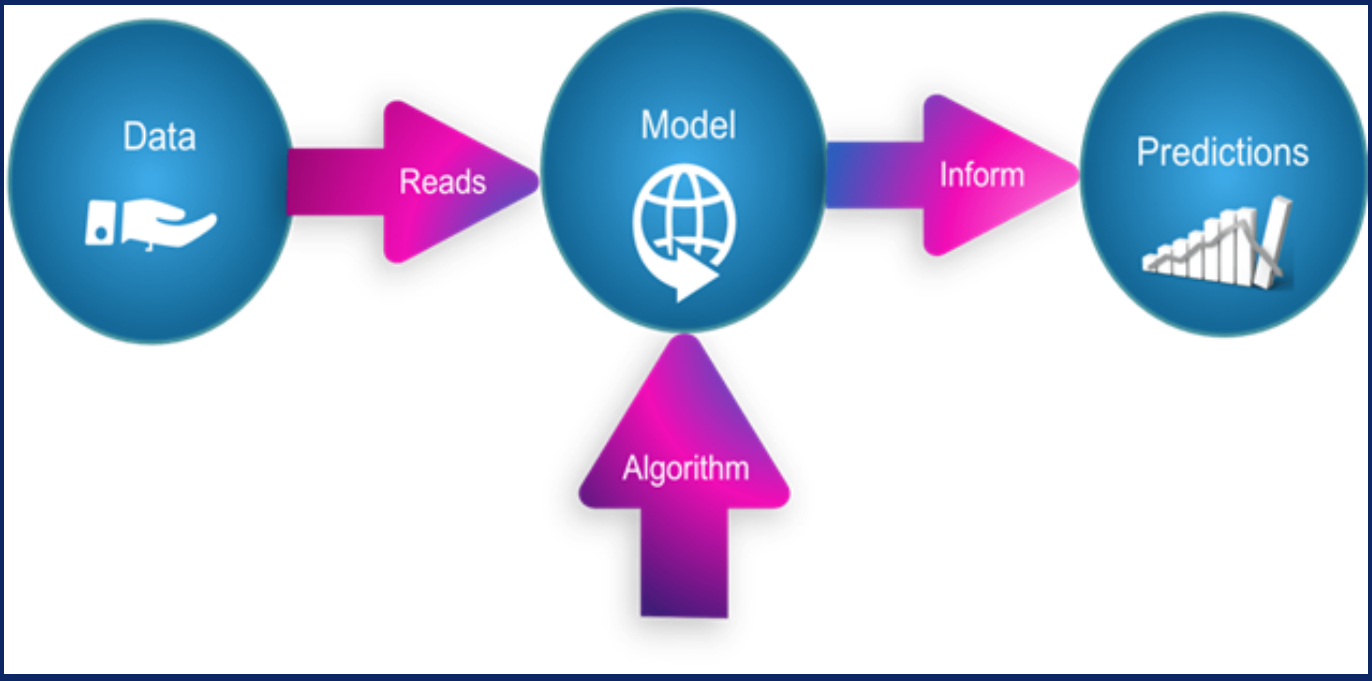
More than ever before the fight to remain relevant is at its zenith. Society demands astute functionality, success parameters keep changing. Level headed thinking, reasonable knowledge of the future, anchorage along with fleet footedness are the required skills to be successful. Both the learners and teachers have to therefore keep themselves invested in the emerging technologies lest their abilities become obsolete. In India, systems and policies take time for implementation thus apart from teaching organizations, adjunct institutions have to play an increasing role in education. Gone are the days when schools, colleges and universities alone were the sole providers of knowledge and skills. Today, no student can afford to be totally dependent on conventional teaching platforms in order to be up-to-date.

Adapting to newer technologies like AI, 5 G and New Connectivity, Edge Computing, Internet of Behaviours, Quantum Computing, Blockchain, Cyber Security, Human Augmentation, Distributed Cloud, Augmented Reality & Virtual Reality will require a different pedagogical approach. Flexibility, iterative learning, peer to peer learning and other innovative practices are far more effective than conventional education delivery systems.

In many ways the current generation of parents and students are lucky that so many opportunities and alternate paths exist. Scholastic excellence is not the sole criterion for success today. Parallel but equally rewarding ways can be eked out without much efforts. Relevant skills and peaking at the right time is what matters. India is really moving towards a more open and inclusive system of tech education and usage. Just reflect, even a poor village agriculture worker has a bank in his pocket and is able to sell his produce through an App in his smart phone all courtesy of modern technology. And this is just the beginning. Learning and adopting appropriate technology is an absolute necessity for India to progress. Teachers, Parents, Students alike have to discharge this collective tech responsibility. No doubt it's going to be a challenging journey but with the nation's vast resources and demographic dividend it is bound to succeed. For India sky is never the limit.

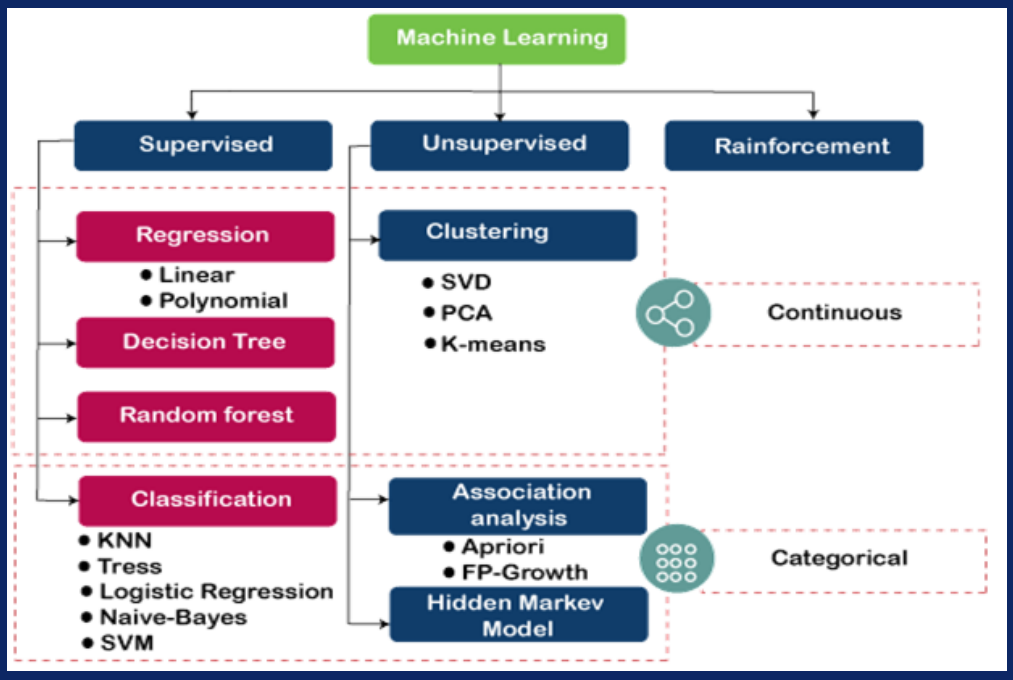
Let us Explore MACHINE LEARNING!

Machine learning (ML) is the study of computer algorithms that can improve automatically through experience and by the use of data. It is seen as a part of artificial intelligence. Machine learning algorithms build a model based on sample data, known as "training data", in order to make predictions or decisions without being explicitly programmed to do so. Machine learning algorithms are used in a wide variety of applications, such as in medicine, email filtering, speech recognition, and computer vision, where it is difficult or unfeasible to develop conventional algorithms to perform the needed tasks.



Machine Learning Algorithms

Machine Learning algorithms are the programs that can learn the hidden patterns from the data, predict the output, and improve the performance from experiences on their own. Different algorithms can be used in machine learning for different tasks, such as simple linear regression that can be used for prediction problems like stock market prediction, and the KNN algorithm can be used for classification problems.



Types of Machine Learning Algorithms

Machine Learning Algorithm can be broadly classified into three types:

1. Supervised Learning Algorithms
2. Unsupervised Learning Algorithms
3. Reinforcement Learning algorithm

1) Supervised Learning Algorithm

Supervised learning is a type of Machine learning in which the machine needs external supervision to learn. The supervised learning models are trained using the labelled dataset. Once the training and processing are done, the model is tested by providing a sample test data to check whether it predicts the correct output.

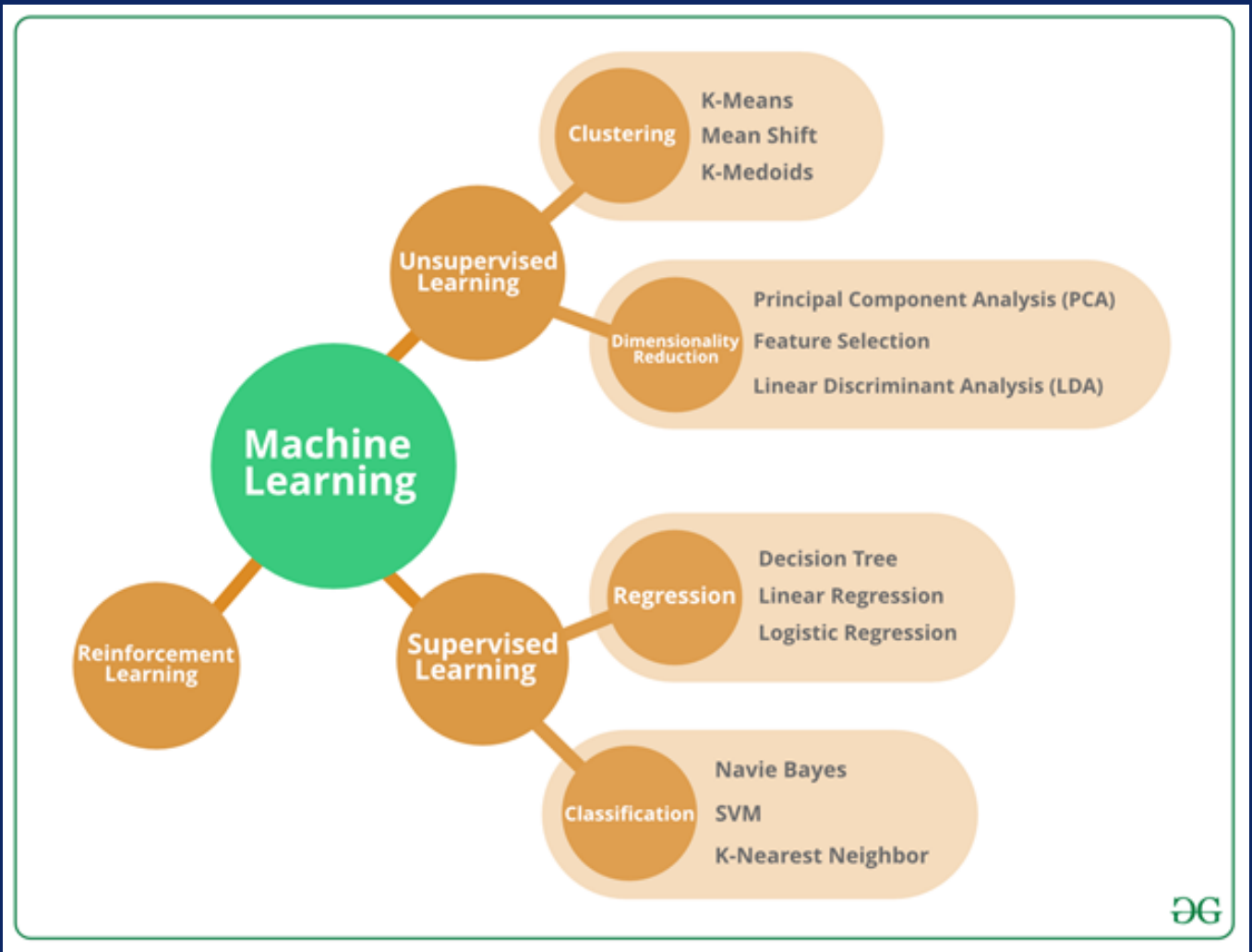
The goal of supervised learning is to map input data with the output data. Supervised learning is based on supervision, and it is the same as when a student learns things in the teacher's supervision. The example of supervised learning is spam filtering.

Examples of some popular supervised learning algorithms are Simple Linear regression, Decision Tree, Logistic Regression, KNN algorithm, etc.

2) Unsupervised Learning Algorithm

It is a type of machine learning in which the machine does not need any external supervision to learn from the data, hence called unsupervised learning. The unsupervised models can be trained using the unlabelled dataset that is not classified, nor categorized, and the algorithm needs to act on that data without any supervision. In unsupervised learning, the model doesn't have a predefined output, and it tries to find useful insights from the huge amount of data. These are used to solve the Association and Clustering problems.

Examples of some Unsupervised learning algorithms are K-means Clustering, Apriori Algorithm, Eclat, etc.

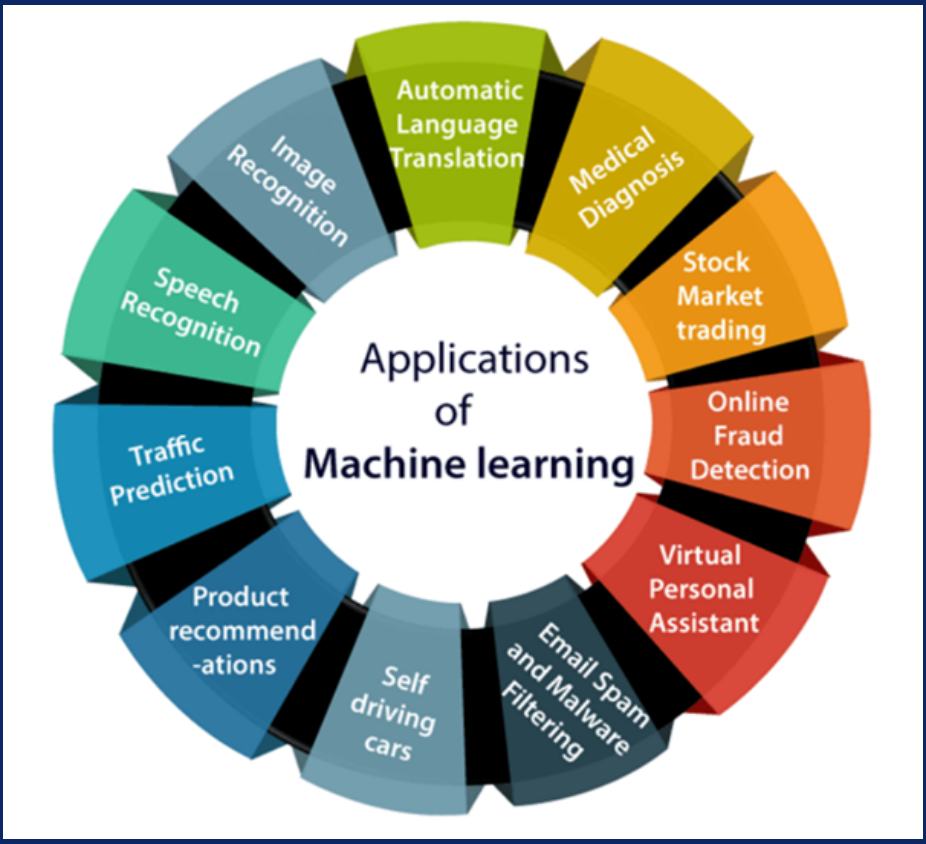


3) Reinforcement Learning

In Reinforcement learning, an agent interacts with its environment by producing actions, and learn with the help of feedback. The feedback is given to the agent in the form of rewards, such as for each good action, he gets a positive reward, and for each bad action, he gets a negative reward. There is no supervision provided to the agent. Q-Learning algorithm is used in reinforcement learning.

Applications Of MACHINE LEARNING

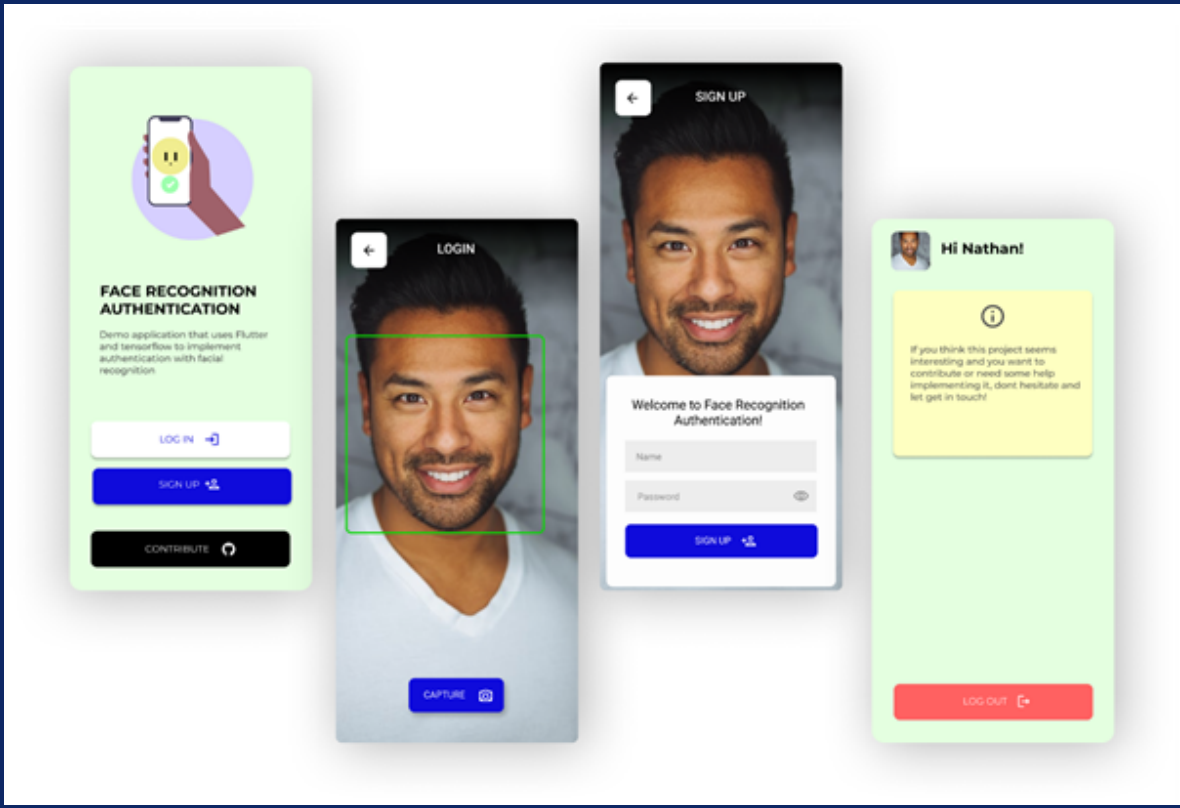
Machine learning is a buzzword for today's technology, and it is growing very rapidly day by day. We are using machine learning in our daily life even without knowing it such as Google Maps, Google assistant, Alexa, etc. Below are some most trending real-world applications of Machine Learning:



1. Image Recognition:

Image recognition is one of the most common applications of machine learning. It is used to identify objects, persons, places, digital images, etc. The popular use case of image recognition and face detection is, **Automatic friend tagging suggestion**. Facebook provides us a feature of auto friend tagging suggestion.

Whenever we upload a photo with our Facebook friends, then we automatically get a tagging suggestion with name, and the technology behind this is machine learning's face detection and recognition algorithm.



2. Speech Recognition

While using Google, we get an option of "Search by voice," it comes under speech recognition, and it's a popular application of machine learning. Speech recognition is a process of converting voice instructions into text, and it is also known as "Speech to text", or "Computer speech recognition." At present, machine learning algorithms are widely used by various applications of speech recognition. Google assistant, Siri, Cortana, and Alexa are using speech recognition technology to follow the voice instructions.

3. Traffic prediction:

If we want to visit a new place, we take help of Google Maps, which shows us the correct path with the shortest route and predicts the traffic conditions. It predicts the traffic conditions such as whether traffic is cleared, slow-moving, or heavily congested with the help of two ways:

- Real Time location of the vehicle form Google Map app and sensors
- Average time has taken on past days at the same time

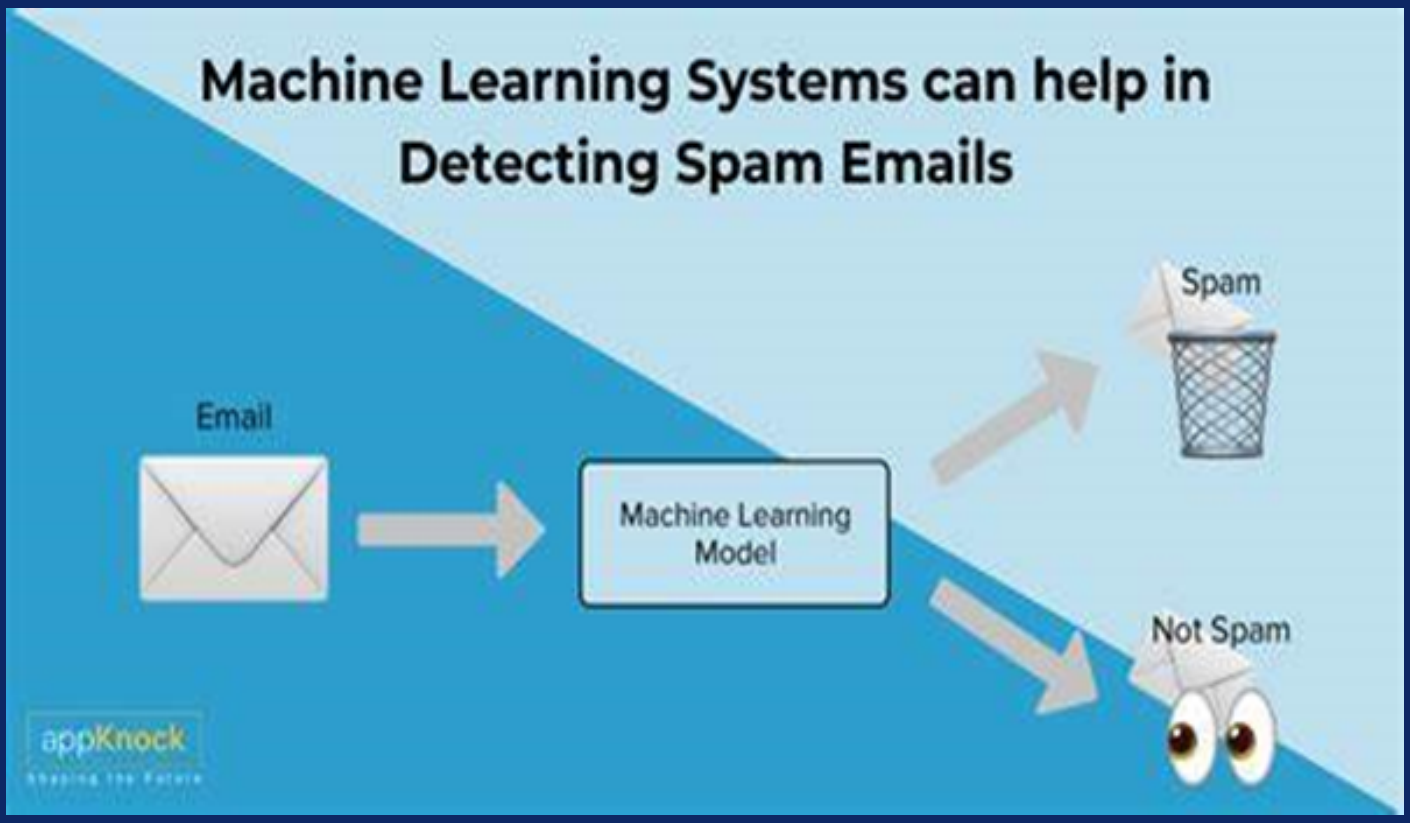
4. Product recommendations:

Machine learning is widely used by various e-commerce and entertainment companies such as Amazon, Netflix, etc., for product recommendation to the user. Whenever we search for some product on Amazon, then we started getting an advertisement for the same product while internet surfing on the same browser and this is because of machine learning.

5. Email Spam and Malware Filtering:

Whenever we receive a new email, it is filtered automatically as important, normal, and spam. We always receive an important mail in our inbox with the important symbol and spam emails in our spam box, and the technology behind this is Machine learning. Below are some spam filters used by Gmail:

- **Content Filter**
- **Header filter**
- **General blacklists filter**
- **Rules-based filters**
- **Permission filters**



Scan QR code to participate!!

ABOUT US

Rabvik Innovations aims to train and prepare the next generation of robotics, scientists, and engineers innovative enough to push the envelope and be creative enough to achieve the impossible. Rabvik Labs prepare the students for a toe-dip in the pool which will become an ocean in the pool which will become an ocean in a few years and will also allow them to get real-life experience in the world of robotics, automation, AI and IoT.

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