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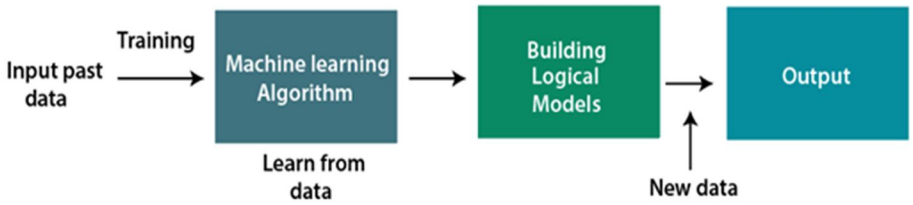
"The Role of Machine Learning in Digital Transformation"

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Abstract: ***Today machine learning it is the part of our daily life. Machine learning is making our day to day life easy from self-driving cars to Amazon History of Machine Learning virtual assistant "Alexa". However, the idea behind machine learning is so old and has a long history. Below some milestones are given which have occurred in the history of machine learning .The field of machine learning has made significant strides in recent years, and its applications are numerous, including self-driving cars, Amazon Alexa, Catboats, and the recommended system. It incorporates clustering, classification, decision tree, SVM algorithms, and reinforcement learning, as well as unsupervised and supervised learning. Present day AI models can be utilized for making different expectations, including climate expectation, sickness forecast, financial exchange examination, and so on.***
Keywords: Deployment, Data Wrangling, Regression, Cluster analysis, Fraud Detection, Data exploration

I. INTRODUCTION

A machine learning system builds prediction models, learns from previous data, and predicts the output of new data whenever it receives it. The amount of data helps to build a better model that accurately predicts the output, which in turn affects the accuracy of the predicted output. Let's say we have a complex problem in which we need to make predictions. Instead of writing code, we just need to feed the data to generic algorithms, which build the logic based on the data and predict the output. Our perspective on the issue has changed as a result of machine learning. The Machine Learning algorithm's operation is depicted in the following block diagram:



II. MACHINE LEARNING LIFE CYCLE

Machine learning has given the computer systems the abilities to automatically learn without being explicitly programmed. But how does a machine learning system work? So, it can be described using the life cycle of machine learning. Machine learning life cycle is a cyclic process to build an efficient machine learning project. The main purpose of the life cycle is to find a solution to the problem or project. Machine learning life cycle involves seven major steps, which are given below: The most important thing in the complete process is to understand the problem and to know the purpose of the problem. Therefore, before starting the life cycle, we need to understand the problem because the good result depends on the better understanding of the problem.In the complete life cycle process, to solve a problem, we create a machine learning system called "model", and this model is created by providing "training". But to train a model, we need data, hence, life cycle starts by collecting data.

1) *Gathering Data:* Data Gathering is the first step of the machine learning life cycle. The goal of this step is to identify and obtain all data-related problems. In this step, we need to identify the different data sources, as data can be collected from various sources such as files, database, internet, or mobile devices. It is one of the most important steps of the life cycle. The quantity and quality of the collected data will determine the efficiency of the output. The more will be the data, the more accurate will be the prediction. This step includes the Identify various data sources, Collect data Integrate the data obtained from different sources. By performing the above task, we get a coherent set of data, also called as a **dataset**. It will be used in further steps.

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2) *Data Preparation:* After collecting the data, we need to prepare it for further steps. Data preparation is a step where we put our data into a suitable place and prepare it to use in our machine learning training. In this step, first, we put all data together, and then randomize the ordering of data. This step can be further divided into two processes: i. Data exploration ii. Data pre-processing.
3) *Data Wrangling:* Data wrangling is the process of cleaning and converting raw data into a useable format. It is the process of cleaning the data, selecting the variable to use, and transforming the data in a proper format to make it more suitable for analysis in the next step. It is one of the most important steps of the complete process. Cleaning of data is required to address the quality issues. It is not necessary that data we have collected is always of our use as some of the data may not be useful. In real-world applications, collected data may have various issues, including Missing Values ,Duplicate data ,Invalid data,Noise etc. So, we use various filtering techniques to clean the data.
4) *Data Analysis:* Now the cleaned and prepared data is passed on to the analysis step. This step involves: Selection of analytical techniques, Building models, Review the result .The aim of this step is to build a machine learning model to analyze the data using various analytical techniques and review the outcome. It starts with the determination of the type of the problems, where we select the machine learning techniques such as Classification, Regression, Cluster analysis, Association, etc. Then build the model using prepared data, and evaluate the model. Hence, in this step, we take the data and use machine learning algorithms to build the model.
5) *Train Model:* In this step we train our model to improve its performance for better outcome of the problem.We use datasets to train the model using various machine learning algorithms. Training a model is required so that it can understand the various patterns, rules, and, features.
6) *Test Model:* In this step, we check for the accuracy of our model by providing a test dataset to it.Testing the model determines the percentage accuracy of the model as per the requirement of project or problem.
7) *Deployment:* The last step of machine learning life cycle is deployment, where we deploy the model in the real-world system. If the above-prepared model is producing an accurate result as per our requirement with acceptable speed, then we deploy the model in the real system. But before deploying the project, we will check whether it is improving its performance using available data or not. The deployment phase is similar to making the final report for a project.

III. 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 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. It is based on the Facebook project named "Deep Face," which is responsible for face recognition and person identification in the picture
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:* ML 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. Google understands the user interest using various machine learning algorithms and suggests the product as per customer interest.As similar, when we use Netflix, we find some recommendations for entertainment series, movies, etc., and this is also done with the help of machine learning.

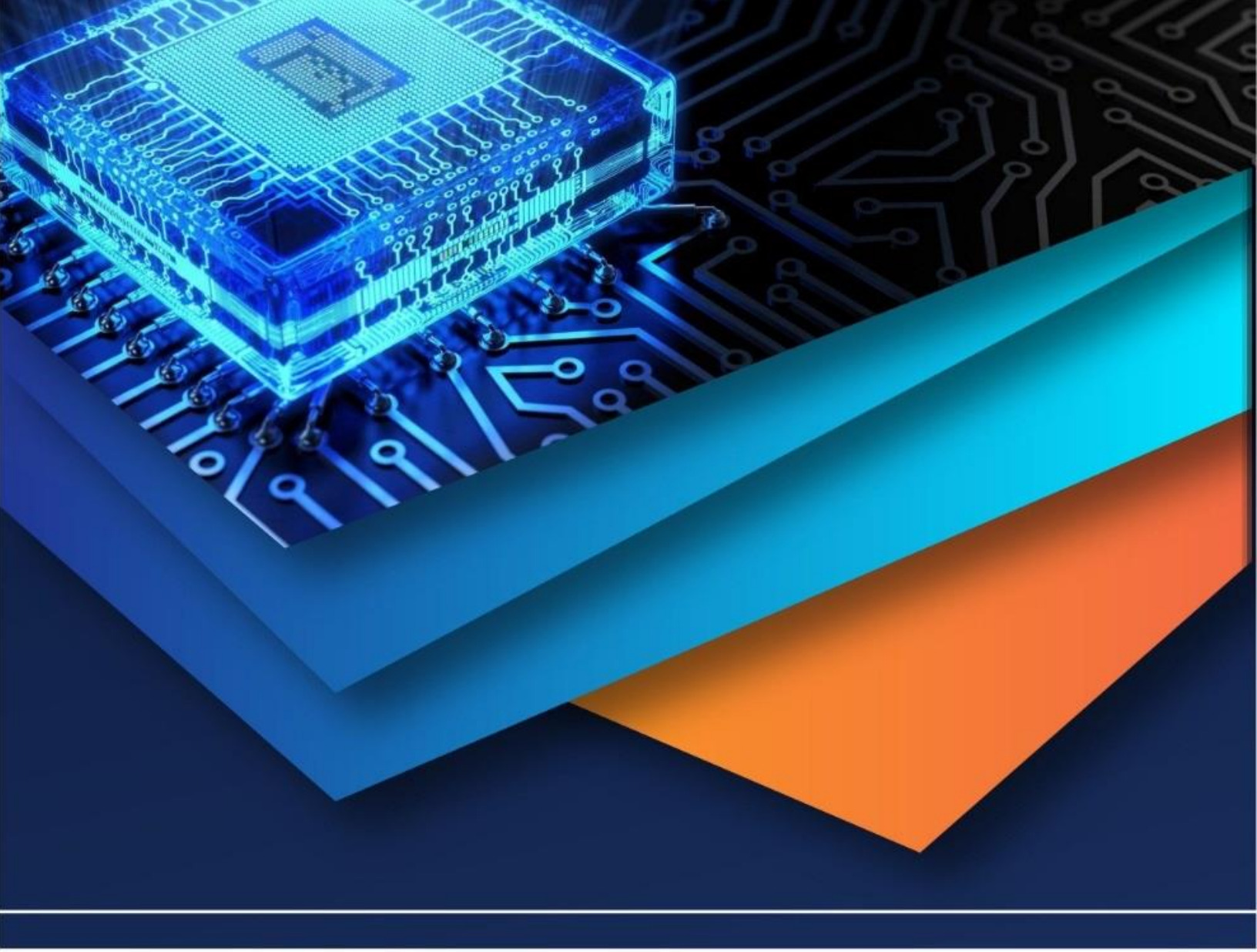
5) *Self-driving Cars:* One of the most exciting applications of machine learning is self-driving cars. Machine learning plays a significant role in self-driving cars. Tesla, the most popular car manufacturing company is working on self-driving car. It is using unsupervised learning method to train the car models to detect people and objects while driving.
6) *Email Spam and Malware Filtering:* The some spam filters used by Gmail. Content Filter, Header filter, General blacklist, Rules-based filter, Permission filters etc. 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 behind this Machine learning technology is used.
7) *Virtual Personal Assistant:* Various virtual personal assistants such as Google assistant, Alexa, Cortana, Siri. As the name suggests, they help us in finding the information using our voice instruction. These assistants can help us in various ways just by our voice instructions such as Play music, call some one, Open an email, Scheduling an appointment, etc.
8) *Online Fraud Detection:* Machine learning is making our online transaction safe and secure by detecting fraud transaction. Whenever we perform some online transaction, there may be various ways that a fraudulent transaction can take place such as fake accounts, fake ids, and steal money in the middle of a transaction. So to detect this, Feed Forward Neural network helps us by checking whether it is a genuine transaction or a fraud
9) *Stock Market Trading:* Machine learning is widely used in stock market trading. In the stock market, there is always a risk of up and downs in shares, so for this machine learning's long short term memory neural network is used for the prediction of stock market trends.
10) *Medical Diagnosis:* In medical science, it is used for diseases diagnoses. With this, medical technology is growing very fast and able to build 3D models that can predict the exact position of lesions in the brain.It helps in finding brain tumors and other brain-related diseases easily.

IV. CONCLUSION

Machine learning has become an increasingly important topic in recent years, as the amount of data generated by businesses and individuals continues to grow at an exponential rate. From self-driving cars to personalized recommendations on streaming platforms, It's algorithms are now used in a wide range of applications. Machine Learning is an incredibly powerful tool. In the coming years, it promises to help solve some of our most pressing problems, as well as open up whole new worlds of opportunity.

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