Machine Learning – Its Applications, Benefits, and Threats

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Abstract:

Machine learning is an important component of the growing field of data science. Through the use of statistical methods, algorithms are trained to make classifications or predictions, and to uncover key insights in data mining projects. These insights subsequently drive decision making within applications and businesses, ideally impacting key growth metrics. As big data continues to expand and grow, the market demand for data scientists will increase. They will be required to help identify the most relevant business questions and the data to answer them [3].This paper covers applications, advantages and disadvantages of machine leaning with respect to human beings.

Keywords: Machine Learning, business, artificial Intelligence, humans

1. Introduction

Machine Learning is an integral part of Artificial Intelligence. We can say that machine learning is nothing but the ability of machines to act as a human based on past data. It consists of various machine learning algorithms where the input is past or previous information or historical data. The algorithms process these data and produce predicted output values based on the last data received. Machine Learning is significant because it gives corporates, businesses, and enterprises to observe trends, business operation patterns, and customer behaviour and fosters the development of new products. Some leading companies that use machine learning on a massive scale are *Uber, Facebook, Google, etc.* Machine Learning has emerged as an important differentiator between these companies [2].

This paper introduces various applications, benefits and disadvantages of machine learning to human.

2. Importance of Machine Learning:

Now a day, we have heard the name Machine Learning everywhere. Take an example, suppose you are watching a video on YouTube then immediately YouTube will show you list of similar kinds of videos to you, right? If suppose you are thinking of buying one top from amazon.com, it will show you list of similar searches to you, have you noticed same? Again, suppose you were traveling then you will get advertisements related to traveling bags, tours, etc., isn't it? It means the machine based on our last searches it shows results to us. And for us it is like the machine did it intelligently.

2.1 Applications of Machine Learning:

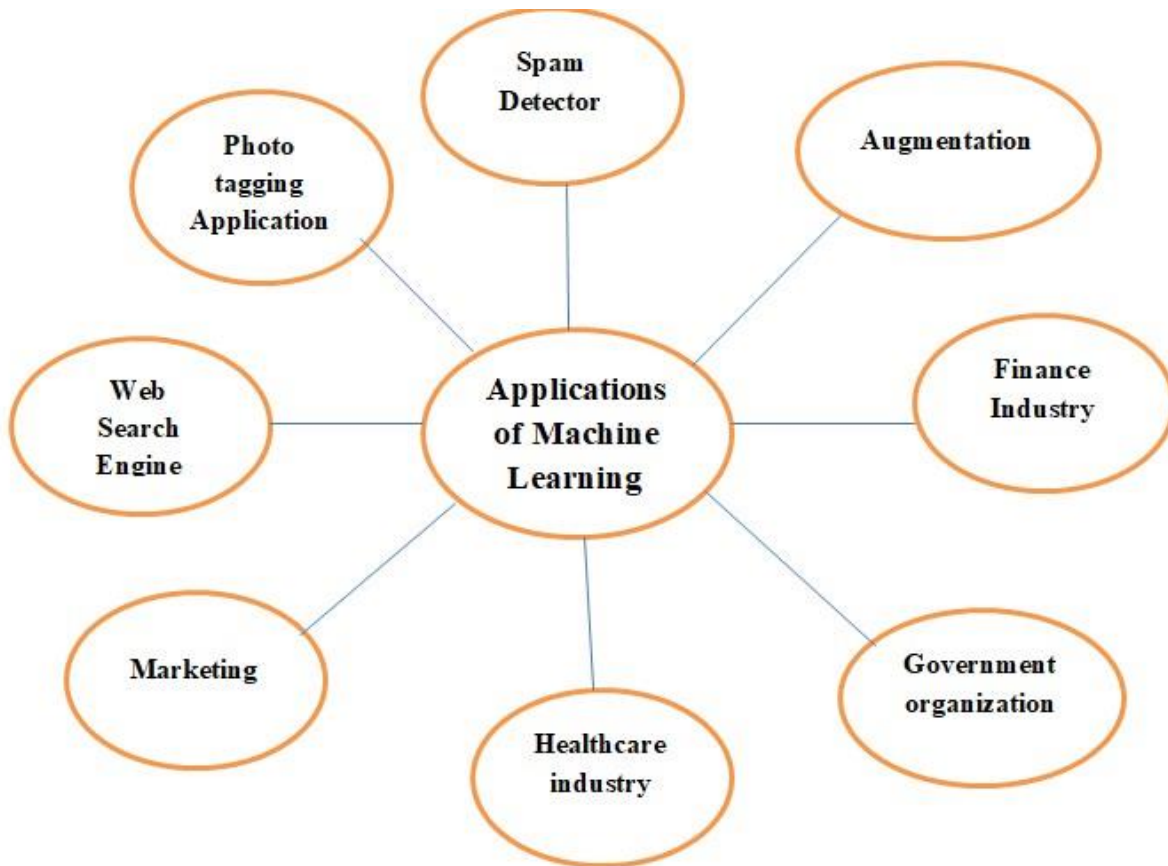Various fields where machine learning is used are:-

Figure 1.Applications of Machine Learning

- **Web Search Engine:** One of the reasons why search engines like Google, Bing etc. work so well is because the system has learnt how to rank pages through a complex learning algorithm.

- **Photo tagging Applications:** Be it Facebook or any other photo tagging application, the ability to tag friends makes it even more happening. It is all possible because of a face recognition algorithm that runs behind the application.

- **Spam Detector:** Our mail agent like Gmail or Hotmail does a lot of hard work for us in classifying the mails and moving the spam mails to spam folder. This is again achieved by a spam classifier running in the back end of mail application.

- **Augmentation**: Machine learning, which assists humans with their day-to-day tasks, personally or commercially without having complete control of the output. Such machine learning is used in different

ways such as Virtual Assistant, Data analysis, software solutions. The primary user is to reduce errors due to human bias.

- **Automation**: Machine learning, this works entirely autonomously in any field without the need for any human intervention. For example, robots performing the essential process steps in manufacturing plants.

- **Finance Industry:** Machine learning is growing in popularity in the finance industry. Banks are mainly using ML to find patterns inside the data but also to prevent fraud.

- **Government organization:** The government makes use of ML to manage public safety and utilities. Take the example of China with the massive face recognition. The government uses Artificial intelligence to prevent jaywalker.

- **Healthcare industry:** Healthcare was one of the first industry to use machine learning with image detection.

- **Marketing:** Broad use of AI is done in marketing thanks to abundant access to data. Before the age of mass data, researchers develop advanced mathematical tools like Bayesian analysis to estimate the value of a customer. With the boom of data, marketing department relies on AI to optimize the customer relationship and marketing campaign.

2.2 Machine Learning and Humans

As we know that machine learning means we humans teach machines to do work based on the data provided. Here, humans provide data which may include past data, current data, or frequently used data. And then programmer writes an algorithm to which deal with this data and the machine then analyses data and predicts what humans actually interested. With these machines learning helps humans by solving many problems where human alone cannot do. Machine learning has many benefits, including improved accuracy, efficiency, and decision-making. Already machine learning has solved many problems [1]-

- **Handling large amounts of data:** With the ever-growing volume of data generated every day, it is increasingly difficult for humans to process and make sense of all this information. Machine learning can help businesses handle large amounts of data more efficiently and effectively and even use decision trees to take action on the information.

- **Reducing bias:** Machine learning algorithms are not biased toward certain data sets, unlike human beings, who may have personal biases that can distort their judgment. As a result, machine learning can help reduce bias in business decisions.

- **Improving accuracy:** Machine learning algorithms can achieve much higher accuracy than humans when making predictions or classifying labeled data. This improved accuracy can lead to better business outcomes and increased profits.

- **Discovering patterns and correlations:** Machine learning can help businesses uncover patterns and correlations in data that they may not have been able to detect otherwise. These learning systems can lead to better decision-making and a deeper understanding of the data.

- **Making predictions about future events:** Machine learning algorithms can predict future events, such as consumer behaviour, stock prices, and election outcomes. This can help businesses plan for the future and take advantage of upcoming opportunities.

2.3 How Machine Learning is dangerous?

Nothing is perfect in the world. Machine Learning has some serious limitations, which are bigger than human errors[2].

1. Data Acquisition

The whole concept of machine learning is about identifying useful data. The outcome will be incorrect if a credible data source is not provided. The quality of the data is also significant. If the user or institution needs more quality data, wait for it. It will cause delays in providing the output. So, machine learning significantly depends on the data and its quality.

2. Time and Resources

The data that machines process remains huge in quantity and differs greatly. Machines require time so that their algorithm can adjust to the environment and learn it. Trials runs are held to check the accuracy and reliability of the machine. It requires massive and expensive resources and high-quality expertise to set up that quality of infrastructure. Trials runs are costly as they would cost in terms of time and expenses.

3. Results Interpretations

One of the biggest advantages of Machine learning is that interpreted data that we get from the cannot be hundred percent accurate. It will have some degree of inaccuracy. For a high degree of accuracy, algorithms should be developed so that they give reliable results.

4. High Error Chances

The error committed during the initial stages is huge, and if not corrected at that time, it creates havoc. Biasness and wrongness have to be dealt with separately; they are not interconnected. Machine learning depends on two factors, i.e., data and algorithm. All the errors are dependent on the two variables. Any incorrectness in any variables would have huge repercussions on the output.

5. Social Changes

Machine learning is bringing numerous social changes in society. The role of machine learning-based technology in society has increased multifold. It is influencing the thought process of society and creating unwanted problems in society. Character assassination and sensitive details are disturbing the social fabric of society.

6. Elimination of Human Interface

Automation, Artificial Intelligence, and Machine Learning have eliminated human interface from some work. It has eliminated employment opportunities. Now, all those works are conducted with the help of artificial intelligence and machine learning.

7. Changing Nature of Jobs

With the advancement of machine learning, the nature of the job is changing. Now, all the work are done by machine, and it is eating up the jobs for human which were done earlier by them. It is difficult for those without technical education to adjust to these changes.

8. Highly Expensive

This software is highly expensive, and not everybody can own it. Government agencies, big private firms, and enterprises mostly own it. It needs to be made accessible to everybody for wide use.

9. Privacy Concern

As we know that one of the pillars of machine learning is data. The collection of data has raised the fundamental question of privacy. The way data is collected and used for commercial purposes has always been a contentious issue. In India, the Supreme court of India has declared privacy a fundamental right of Indians. Without the user's permission, data cannot be collected, used, or stored. However, many cases have come up that big firms collect the data without the user's knowledge and using it for their commercial gains.

10. Research and Innovations

Machine learning is evolving concept. This area has not seen any major developments yet that fully revolutionized any economic sector. The area requires continuous research and innovation.

3. Conclusion

In this paper we have discussed what is machine learning is exactly. We have seen various applications of machine learning. We discussed how the machine learning is beneficial for human beings. Though machine learning analyses large volume of data and gives us output within seconds. With the advantages it may have some disadvantages. The problem is that sometimes results are not accurate or hundred percent correct. Due to this it is dangerous if one could rely on the outcome of machine learning.

4. References:

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