

# Machine Learning

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**Abstract-** Artificial Intelligence and data science services are penetrating every aspect of Industry, start from chatbots being deployed to assist customers to use AI-driven platforms being harnessed to automate sales processes. Artificial Intelligence Services are provided to Companies for developing a range of AI Solutions that can learn and think same like human using Text Analysis, Speech Recognition, Natural Language Processing (NLP) and Machine learning feature. Machine learning makes it possible to build systems which can handle tasks which cannot be programmed. Imagine a robot performing surgeries and the first robot citizen Sophia that operate independently, learn from surroundings and interact with people. Through this paper I would like to bring in how world is moving toward Artificial Intelligence and how Machine learning concept is used to make machine can work like humans and focus on problem solving and enhancing productivity. In today's world it is becoming very difficult to program intuition, because in a real world situation it is not always possible to identify the key abstractions required to identify a situation - to separate information from noise. Machine learning removes the need to identify said abstractions - the machine figures them out for itself.

**Key Words :** Machine Learning, Artificial Intelligence, Learning Methods.

## I. Introduction

Machine learning is an application of artificial intelligence (AI) that provides systems the ability to automatically learn and improve from experience without being explicitly programmed. **Machine learning focuses on the development of computer programs** that can access data and use it learn for themselves. Machine learning enables computers to get into a mode of self-learning without being explicitly programmed. When exposed to new data, these computer programs are enabled to learn, grow, change, and develop by themselves. There is so much positive benefit that Machine Language is bringing to the world, and we're just opening up the possibilities. Once it becomes easier to implement, and anyone can do it, the benefit will continue to multiply.

Machine learning is a data analytics technique that teaches computers to do what comes naturally to humans and animals: learn from experience. Machine learning algorithms use computational methods to "learn" information directly from data without relying on a predetermined equation as a model. The algorithms adaptively improve their performance as the number of samples available for learning increases. **The primary aim is to allow the computers learn automatically** without human intervention or assistance and adjust actions accordingly as it is very difficult to program intuition, because in a real world situation it is not always possible to identify the key abstractions required to identify a situation - to separate information from noise. Machine learning removes the need to identify said abstractions - the machine figures them out for itself.

## II. Learning Methods

Machine learning algorithms are often categorized as supervised or unsupervised.

- **Supervised machine learning algorithms** can apply what has been learned in the past to new data using labeled examples to predict future events. Starting from the analysis of a known training dataset, the learning algorithm produces an inferred function to make predictions about the output values. The system is able to provide targets for any new input after sufficient training. The learning algorithm can also compare its output with the correct, intended output and find errors in order to modify the model accordingly.

- In contrast, **unsupervised machine learning algorithms** are used when the information used to train is neither classified nor labeled. Unsupervised learning studies how systems can infer a function to describe a hidden structure from unlabeled data. The system doesn't figure out the right output, but it explores the data and can draw inferences from datasets to describe hidden structures from unlabeled data.
- **Semi-supervised machine learning algorithms** fall somewhere in between supervised and unsupervised learning, since they use both labeled and unlabeled data for training – typically a small amount of labeled data and a large amount of unlabeled data. The systems that use this method are able to considerably improve learning accuracy. Usually, semi-supervised learning is chosen when the acquired labeled data requires skilled and relevant resources in order to train it / learn from it. Otherwise, acquiring unlabeled data generally doesn't require additional resources.
- **Reinforcement machine learning algorithms** is a learning method that interacts with its environment by producing actions and discovers errors or rewards. Trial and error search and delayed reward are the most relevant characteristics of reinforcement learning. This method allows machines and software agents to automatically determine the ideal behavior within a specific context in order to maximize its performance. Simple reward feedback is required for the agent to learn which action is best; this is known as the reinforcement signal.

### III. Uses

The machine learning is applied: the self-driving Google car, Human Robots, cyber fraud detection, online recommendation engines—like friend suggestions on Facebook, Netflix showcasing the movies and shows you might like, and “more items to consider” and “get yourself a little something” on Amazon—are all examples of applied machine learning. All these examples echo the vital role machine learning has begun to take in today's data-rich world. Machines can aid in filtering useful pieces of information that help in major advancements, and we are already seeing how this technology is being implemented in a wide variety of industries. There's plenty of ways machine learning are helping our lives get better. Some of them are so instrumental to our lives, we probably couldn't live without them. For example, when you're booking a taxi, you're shown how much the trip would cost. Or when you're on the trip, you're shown the path the taxi would take to reach your destination.

Data analysis was always being characterized by trial and error, and has become impossible when data sets are large and heterogeneous. Machine learning has become the solution to all this chaos by proposing clever alternatives to analyzing huge volumes of data. By developing fast and efficient algorithms and data-driven models for real-time processing of data, machine learning is able to produce accurate results and analysis.

### IV. Conclusion

These days' machine learning techniques are being widely used to solve real world problems by storing, manipulating, extracting and retrieving data from large sources. Supervised machine learning techniques have been widely adopted however these techniques prove to be very expensive when the systems are implemented over wide range of data. This is due to the fact that significant amount of effort and cost is involved because of obtaining large labeled data sets. Thus active learning provides a way to reduce the labeling costs by labeling only the most useful instances for learning; however Machine Learning is an incredibly powerful tool in solving some pressing problems and open the world of opportunity. Machine Learning is used in various fields like Manufacturing, retail, telecom, healthcare and life sciences, BFSI etc. Machine learning are used in sector to integrate structured and unstructured data.

### References:

1. <https://www.simplilearn.com/what-is-machine-learning-and-why-it-matters-article>
2. <https://www.techemergence.com/what-is-machine-learning>
3. <https://www.mathworks.com/discovery/machine-learning.html>