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APPLICATIONS OF ARTIFICIAL INTELLIGENCE USING MACHINE LEARNING ALGORITHMS

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Abstract. *Machine Learning is one of the most happening in recent technologies in Artificial Intelligence. Learning algorithms in many applications that we make use of daily. Every time a web search engine like Google or Bing is used to search the internet, one of the reasons that work so well is because of a learning algorithm. Every time Facebook is used and it recognizes friends' photos, that's also machine learning. Spam filters in email save the user from having to wade through tons of spam email, that's also a learning algorithm. In this paper, a brief review and future prospect of the vast applications of machine learning is seen.*

1. Introduction

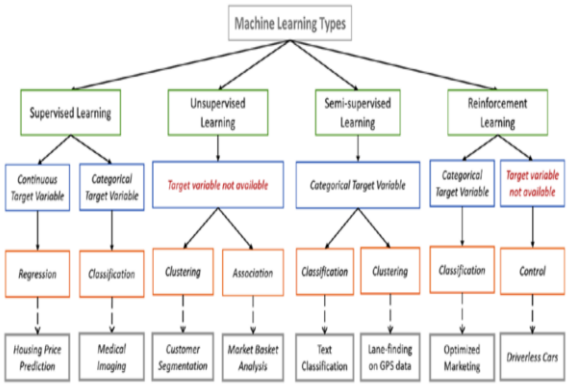
Artificial Intelligence
The theory and development of computer systems able to perform tasks normally requiring human intelligence, such as visual perception, speech recognition, decision-making, and translation between languages.
Machine Learning
The use and development of computer systems those are able to learn and adapt without following explicit instructions, by using algorithms and statistical models to analyse and draw inferences from patterns in data.
AI and ML is creating a new vision of machine-human collaboration and taking businesses to new levels. Machine learning helps organizations across various industrial domains to develop intelligent solutions based on proprietary or open - source algorithms/frameworks that processes data and runs sophisticated algorithms on cloud and edge. Machine Learning models can be built, trained, validated, optimized, deployed, and tested using the latest tools and technologies. This ensures faster decision-making, increased productivity, business process automation, and faster anomaly detection for businesses.
As a whole, artificial intelligence contains many subfields, including:

- Machine learning
- Neural Network
- Deep Learning
- Computer Vision
- Natural Language Processing

Machine learning automates analytical model building. It uses methods from neural networks, statistics, operations research and physics to find hidden insights in data without being explicitly programmed where to look or what to conclude.
While machine learning is based on the idea that machines should be able to learn and adapt through experience, AI refers to a broader idea where machines can execute tasks "smartly."
TYPES OF MACHINE LEARNING ALGORITHMS

- Supervised Machine Learning Algorithm
- Unsupervised Machine Learning Algorithm

- Semi-Supervised Machine Learning Algorithm
- Reinforcement Machine Learning Algorithm



Supervised Machine Learning Algorithm

Supervised Learning Algorithms are the ones that involve direct supervision (cue the title) of the operation. In this case, the developer labels the sample data corpus and set strict boundaries upon which the algorithm operates. It is a spoofed version of machine learning:

- you select what kind of information output (samples) to "feed" the algorithm;
- what kind of results it is desired (for example yes/no or true/false)?

From the machine's point of view, this process becomes more or less a "connect the dots" routine.

The primary purpose of supervised learning is to scale the scope of data and to make predictions of unavailable, future, or unseen data based on labeled sample data.

Unsupervised Machine Learning Algorithm

It is one that does not involve direct control of the developer. If the main point of supervised machine learning is that you know the results and need to sort out the data, then in the case of unsupervised machine learning algorithms the desired results are unknown and yet to be defined.

Another big difference between the two is that supervised learning uses labeled data exclusively, while unsupervised learning feeds on unlabelled data.

The unsupervised machine learning algorithm is used for:

- exploring the structure of the information;
- extracting valuable insights;
- detecting patterns;
- implementing this into its operation to increase efficiency.

In other words, unsupervised machine learning describes information by sifting through it and making sense of it.

Semi-Supervised Machine Learning Algorithm

Semi-supervised learning algorithms represent a middle ground between supervised and unsupervised algorithms. In essence, the semi-supervised model combines some aspects of both into a thing of its own.

Semi-supervised algorithms work as:

A semi-supervised machine-learning algorithm uses a limited set of labeled sample data to shape the requirements of the operation (i.e., train itself).

The limitation results in a partially trained model that later gets the task to label the unlabelled data. Due to the limitations of the sample data set, the results are considered pseudo-labelled data.

Finally, labelled and pseudo-labelled data sets are combined, which creates a distinct algorithm that combines descriptive and predictive aspects of supervised and unsupervised learning.
Semi-supervised learning uses the classification process to identify data assets and the clustering process to group it into distinct parts.

Reinforcement Machine Learning Algorithm
Reinforcement learning represents what is commonly understood as machine learning artificial intelligence.
In essence, reinforcement learning is all about developing a self-sustained system that, throughout contiguous sequences of tries and fails, improves itself based on the combination of labeled data and interactions with the incoming data.
Reinforced ML uses the technique called exploration/exploitation. The mechanics are simple - the action takes place, the consequences are observed, and the next action considers the results of the first action.
In the centre of reinforcement learning algorithms are reward signals that occur upon performing specific tasks. In a way, reward signals are serving as a navigation tool for the reinforcement algorithms. They give it an understanding of right and wrong course of action.

2. APPLICATIONS OF MACHINE LEARNING IN REAL LIFE USING ARTIFICIAL INTELLIGENCE

1. **Image Recognition**
   Image Recognition is one of the most significant Machine Learning and artificial intelligence examples. Basically, it is an approach for identifying and detecting a feature or an object in the digital image. Moreover, this technique can be used for further analysis, such as pattern recognition, face detection, face recognition, optical character recognition, and many more.
2. **Sentiment Analysis**
   It is another real-time machine learning application. It also refers to opinion mining, sentiment classification, etc. It's a process of determining the attitude or opinion of the speaker or the writer. In other words, it's the process of finding out the emotion from the text.
3. **News Classification**
   It is one of the main applications. Presently the volume of data is tremendously growing. Every person has his individual interest or choice. So, picking or gathering appropriate information becomes a challenge to the users from the ocean of this web. Providing that interesting category of news to the target readers will surely increase the acceptability of news sites. Moreover, readers or users can search for specific news effectively and efficiently.
4. **Video Surveillance**
   A small video file contains more information than text documents and other media files such as audio and images. For this reason, extracting useful information from video, i.e., the automated video surveillance system, has become a hot research issue. With this regard, video surveillance is one of the advanced applications of a machine learning approach.

5. **E-mail Classification and Spam Filtering**
   To classify email and filter spam in an automatic way machine learning algorithm is employed. There are many techniques, i.e., multi-layer perception, C4.5 decision tree induction, used to filter spam. Rule-based spam filtering has some drawbacks to filter spam, whereas spam filtering using the ML approach is more efficient.
6. **Speech Recognition**
   It is the process of transforming spoken words into text. It is additionally called automatic speech recognition, computer speech recognition, or speech to text. This field is benefited from the advancement of the machine learning approach and big data.
7. **Online Fraud Detection**
   Online fraud detection is an advanced application of a machine learning algorithm. This approach is practical to provide cyber security to the users efficiently.
8. **Classification**
   Classification or categorization is the process of classifying the objects or instances into a set of predefined classes. The use of the machine learning approach makes a classifier system more dynamic. The goal of the ML approach is to build a concise model. This approach is to help to improve the efficiency of a classifier system.
9. **Author Identification**
   Author identification also is known as authorship identification. The author identification system may use a variety of fields, such as criminal justice, academia, and anthropology.
10. **Prediction**
    Prediction is the process of saying something based on the previous history. It can be weather prediction, traffic prediction, and many more. All sorts of forecasts can be done using a machine learning approach.
11. **Regression**
    Regression is another application of machine learning. There are several techniques for regression is available.
    Suppose X1, X2, X3 ,....Xn are the input variables, and Y is the output. During this case, using machine learning technology to provide the output (y) on the idea of the input variables (x). A model is used to precise the connection between numerous parameters as below:
    $Y=g(X)$
    Using a machine learning approach in regression, the parameters can be optimized.
12. **Services of Social Media**
    Social media uses the machine learning approach to create attractive and splendid features, i.e., people you may know, suggestion, react options for their users. These features are just an outcome of the machine learning technique.
13. **Medical services**
    It is used to detect the disease, therapy planning, medical-related research, prediction of the disease situation, which brings a breakthrough in our medical service.
14. **Recommendation for products and services**
    We find recommendations of products based on search or purchase of products after a couple of days. This recommendation is the advanced application of machine learning.
15. **Online Customer Support**

In this they develop a chatbot to chat with the customer in order to get their opinions using machine learning algorithms.

16. **Age/Gender identification**
    Age or gender identification is an important task for many cases. Age or gender identification can be made using a machine learning and AI algorithm, i.e., using an SVM classifier.
17. **Language Identification**
    It is the process of identifying the type of language. Apache Open NLP, Apache Tika is the language identifying software. There are several approaches which among artificial intelligence and machine learning are efficient.
18. **Information Retrival**
    It is the process of extracting data or knowledge or structured data from the unstructured data which can be through various sources like websites, web blogs and social media.
19. **Robot Control**
    A machine learning algorithm is used in a variety of robot control systems. For instance, recently, several types of research have been working to gain control over stable helicopter flight and helicopter aerobatics.
20. **Virtual Personal Assistant**
    Some of the virtual personal assistants are smart speakers of amazon echo and google home, mobile apps of google allo. These take inputs and process those inputs and give the resultant outputs.

3. CONCLUSION

Artificial Intelligence and Machine Learning are products of both science and myth. The idea that machines could think and perform tasks just as humans do is thousands of years old. The cognitive truths expressed in AI and Machine Learning systems are not new either. It may be better to view these technologies as the implementation of powerful and long-established cognitive principles through engineering.

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