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A Review on Artificial Intelligence and Machine Learning

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Abstract: Today's world is a place where huge amount of data gets collected every day, and it becomes very difficult to handle this data and find meaningful insights from these chunks of data; to find information of a certain trend or to predict upcoming events. These data are processed, mined and analyzed to make it informative, this process becomes very lengthy to be carried out by humans. Hence to make it easier humans have developed techniques to train computers in such a way that they can identify out the information by itself. Artificial Intelligence and machine learning together with other techniques make these tasks come into action. Here we have discussed about what we have learnt and understood about Artificial Intelligence and Machine Learning.
Keywords: Algorithm, dataset, implement, insights, models, patterns, prediction, regression.

1. INTRODUCTION

There are many domains from where raw data is extracted like cyber security (emails, phone number details, IP address), health care records, loans data, social media accounts data, etc. if we properly examine and classify these data and fit into computers then we can make models with the help of Machine learning which would automatically provide meaningful outputs. Based on these data when a machine is able to make decisions, identify patterns and recognise things like humans can do is termed as artificial intelligence.

2. ARTIFICIAL INTELLIGENCE

Artificial intelligence is the ability of a machine to carry out the perceptual tasks that humans typically associate with our minds. This broad area of computer science is concerned with creating intelligent machines that can perform well-behaved jobs that normally demand for human intellect. Although artificial intelligence (AI) is an interdisciplinary subject with many applications, developments in machine learning and deep learning in particular are causing a paradigm change in almost every area of the tech sector..

2.1 Machine Learning

Machine Learning is a branch of artificial intelligence which includes learning patterns from the given dataset to automatically develop algorithms so that future predictions can be done on such types of data. The term Machine Learning was introduced by a pioneer named Arthur Samuel. It makes computers able to learn new patterns by itself without the requirement of programming it every time. It uses statistics, probability and algorithms to predict the outputs i.e., insights of the data. It is a subset of artificial intelligence. It uses historical data to derive predictions about the new data. It can perform predictions on large data sets which is not possible for humans to go through.

3. USE OF ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING

These technologies offer a number of sensory benefits that make them an excellent tool for almost any modern organisation, such as:

- Automation is the process of carrying out a tedious activity that was previously completed by hand without experiencing stress or needing breaks, as would be the case with a human employee.
- Enhancement entails making goods and services more intelligent and efficient, enhancing end-user experimentation through features like better product solicitation and conversational optimisation for both parties.
- Analysis: Compared to humans, it can analyse data far more fast, allowing it to identify patterns much more swiftly. It can also analyse far larger datasets than humans, allowing it to uncover patterns that humans would simply miss.
- Accuracy is the ability to learn more information than humans do. This ability can be used to crop and interpret data, improving judgement for activities like gathering financial data or spotting malignant growths on x-rays.
- ROI is a technology that maximises the value of data by performing a superior analysis of complex, multi-variate correlations without the need for breaks or errors. This makes it an unreliable but helpful tool for any business that relies on data and operates on a large scale.

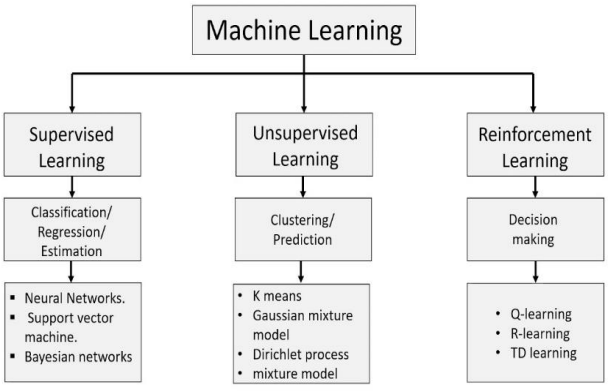
4. VARIOUS SCOPES

The goal is to programme computer intelligence so that it can solve issues in real time and assist businesses and regular people in achieving their goals. Robotics, computer vision, expert systems, speech recognition, machine games, and other fields are likely. The more you understand the disciplines of machine learning, like biology or physics, the better.

Examine the neurological system and psychology to gain a biological understanding of artificial intelligence. Programming languages proficiency is usually required for employment. curriculum that stands out in the areas of machine learning and artificial intelligence to help students take advantage of career prospects in these fields.

4.1 Machine Learning Algorithms

Machine learning algorithms usually take in and process data to learn the connected patterns about different events. Here we have discussed various types of machine learning algorithms.



[1] Supervised Learning

Supervised learning is a task of machine learning that learns a function which maps an input to an output based on labeled training data. It uses labeled data and a group of training examples to conclude a function. It is carried out when some targets are identified to perform a certain set of inputs also called task-driven approach. There are two types of supervised learning discussed below:

Classification-KNN (K-Nearest Neighbors), SVM (Support Vector Machine), Naïve Bayes, Decision Tree are some of the classification algorithms. Here the output label can be among any of the classes based on input features.

Regression-Linear Regression, Polynomial Regression, Random Forest are some of the regression algorithms of regression. This technique is used to predict continuous values and fits the data, majorly for areas like stock prices, housing prices etc.

[2] Unsupervised Machine Learning

Unsupervised learning examines unlabeled datasets without the requirement of any human supervision. Commonly used for finding generative features, grouped results; performs tasks like clustering, finding association rules, anomaly detection density estimation, dimensionality reduction, feature learning, etc.

Clustering-to group similar data together is known as clustering. It is done on the basis of similar characteristics of data. K-means, Hierarchical clustering is a part of it.

Dimensionality reduction-to reduce the number of inputs in a dataset is known as dimensionality reduction. It does so by preserving original information to the maximum possible. It helps in reducing complexity of the given dataset hence it becomes easier to visualize and analyze efficiently. PCA (Principal Component Analysis), Autoencoders are example of some dimensional reduction algorithms.

[3] Reinforcement

Reinforcement shows environment-driven approach i.e., enables software representatives and systems to automatically evaluate the optimal behavior in some particular framework or nature to improve its efficiency. It is used for training models that help in automation and enhance operational efficiency of cultured systems like robotics, self-directed driving, manufacturing, but is not desirable to use for solving straightforward problems. There are two types of reinforcement – Positive Reinforcement and Negative Reinforcement.

5. APPLICATIONS

Healthcare-The biggest condition is on renovate patient result and reducing costs. Medical diagnoses than humans. With the help of AI mines patient data and other accessible data switch to form an obligation, which it then presents with a confidence scoring schema. The best-way of healthcare technologies is IBM Watson. An phalanx of AI technologies is also being used to vaticinate, struggle and comprehend pandemics like COVID-19.

Business- Machine learning algo. is being unified into analytics and customer relationship management platforms to uncover information on how to better serve customers. Chatbots have been integrated into the websites to provide prompt service to customers. The quick advancement of manufacturing AI technology like ChatGPT is required to have far-reaching consequences: eliminating jobs, revolutionizing product design and disrupting business models.

Education -AI can automatically perform grading, giving instructor more time for other tasks. It can keep an eye on students and find to their needs.AI tutors can provide extra recourse to students, ensuring they remain on scent. The technology could also learn that where and how students learn.

Finance-AI in respective finance applications, such as TurboTax or Intuit Mint, is dislocate financial institutions. Applications are collected from the personal date provides customers and users financial advice. Many programs, as IBM Watson, have been germane to the process of purchase a home.

Law-Transfer through documents - in law is often unavoidable for humans. manners AI to help automate the juristic industry's labor-impossible processes is saving time and improving client service. Law's use machine learning to delineate data and predict outcomes, computer view to describe and reference information from documents, and NLP to explain requests for information.

Entertainment and media-The entertainment industries widely use AI techniques for mostly advertisement, recommending content, distribution, detecting fraud, creating scripts and making and editing movies. Like Netflix, Jio cinema can recommend similar genre shows according to our watch preference.

6. CONCLUSION

We have covered in brief in this paper how different kinds of machine learning techniques can be applied to create artificial intelligence solutions for a range of real-world problems. Data and algorithmic performance are key components of a successful machine learning model. We also talked about some well-known uses for machine learning and artificial intelligence to understand how these approaches might be applied to a variety of problems. From a technical point of view, we believe that our research on AI and machine learning-based solutions offers a promising approach and can serve as a beginner's manual for experts in academia and business.

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