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Importance of "Machine learning"

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Introduction

A machine learning system learns from historical data, builds predictive models, and predicts outputs for it whenever it receives new data. The accuracy of the predicted output depends on the amount of data, as a larger amount of data helps build a better model that predicts the output more accurately.

We have a complex problem, where we need to make some predictions, so instead of writing a code for the same, we just need to feed the data to generic algorithms, and with the help of these algorithms, the machine logics accordingly. Makes Predict data and outputs. Machine learning has changed the way we think about problems. The block diagram below explains the working of a machine learning algorithm.

Keywords- modernization, machine learning, output, science fiction, imagination, invention.

History of Machine Learning

Before some years (about 40-50 years), machine learning was science fiction, but today it is a part of our daily life. Machine learning is making our day-to-day lives easier, from self-driving cars to the Amazon virtual assistant "Alexa". However, the idea behind machine learning is much older.

In 1834, Charles Babbage, the father of the computer, envisioned a device that could be programmed with punch cards. Although the machine was never built, all modern computers depend on its logical structure.

In 1936, Alan Turing gave a theory of how a machine could determine and execute a set of instructions.

In 1940, the first manually operated computer, "ENIAC", was invented, which was the first electronic general-purpose computer. Then came the invention of stored program computers like EDSAC in 1949 and EDVAC in 1951. In 1943, a human neural network was modeled with an electrical circuit. In the 1950s, scientists began to apply their idea to work and analyze how human neurons might work. In 1950, Alan Turing published a seminal paper on the subject of artificial intelligence titled "Computer Machinery and Intelligence". In his paper he asked, "Can machines think?" In 1959, the first neural network was applied to the real-world problem of removing echoes on phone lines using an adaptive filter.

In 1985, Terry Sejnowski and Charles Rosenberg invented NetTalk, a neural network capable of teaching itself how to pronounce 20,000 words correctly in a week.

1997: IBM's Deep Blue intelligent computer wins a chess game against chess expert Garry Kasparov and becomes the first computer to beat a human chess expert. In the year 2006, computer scientist Geoffrey Hinton gave a new name to neural net research as "deep learning" and nowadays, it has become one of the most prevalent techniques.

In 2012, Google built a deep neural network that learned to recognize images of humans and cats in YouTube videos. In 2014, Chabot "Eugen Goostmann" cleared the Turing test. It was the first Chabot that convinced 33% of the human judges that it was not a machine.

2014: DeepFace was a deep neural network created by Facebook, and they claimed that it could recognize a person with the same accuracy as a human could. 2016: AlphaGo defeated world number two Lee Sedol in the game Go. In 2017, it defeated the number one player of the game, Ke Gee. In 2017, Alphabet's Ara team created an intelligent system capable of learning online trolling. It read millions of comments from various websites to learn how to stop online trolling.

Today Machine learning

Today machine learning has greatly advanced in its research, and is present everywhere around us, such as self-driving cars, Amazon Alexa, catbots, recommender systems, and more. This includes supervised, unsupervised and reinforcement learning with clustering, classification, decision trees, SVM algorithms, etc.

In modern times, machine learning models can be used for various predictions, including weather forecasting, disease prediction, stock market analysis, etc.

According to a Fortune Business Insights report, the global machine learning market is projected to grow from \$15.50 billion in 2021 to \$152.24 billion in 2028. Enterprises around the world are increasingly looking to machine learning solutions to overcome business challenges and deliver insights and innovative solutions. And even though the benefits of machine learning are becoming more apparent, many companies face challenges in adopting machine learning.

Machine Learning Methodology

Machine learning is undoubtedly one of the most exciting subsets of artificial intelligence. It accomplishes the task of learning from data with specific inputs to the machine. It is important to understand what makes machine learning work and thus, how it can be used in the future.

The machine learning process begins with feeding training data to the selected algorithm. Training data to be known or unknown data to develop the final machine learning algorithm. The type of training data input affects the algorithm, and that concept will be covered momentarily. New input data is fed into the machine learning algorithm to test whether the algorithm works correctly or not. The prediction and result are then checked against each other. If the prediction and result do not match, the algorithm is re-trained several times until the data scientist gets the desired result. This enables the machine learning algorithm to continuously learn on its own and provide optimal answers, gradually increasing in accuracy over time.

Features of Machine Learning

- Machine learning uses data to detect various patterns in a given dataset.
- It can learn from past data and make improvements automatically.
- It is a data-driven technology.
- Machine learning is similar to data mining as it also deals with massive amounts of data.

Uses of machine learning

Typical results of machine learning applications typically include web search results, real-time advertising on web pages and mobile devices, email spam filtering, network intrusion detection, and pattern and image recognition. These are all by-products of using machine learning to analyze massive amounts of data. Traditionally, data analysis was trial-and-error-based, an approach that became increasingly impractical thanks to the rise of large, heterogeneous data sets. Machine learning provides smart alternatives for large scale data analysis. Machine learning can generate accurate results and analysis by developing fast and efficient algorithms and data-driven models for real-time data processing.

Need of machine learning in human life

The need for machine learning is increasing day by day. The reason behind the need for machine learning is that it is capable of performing tasks that are too complex for a human to implement directly. As a human, we have some limitations as we cannot access huge amount of data manually so for this we need some computer system and here comes machine learning which makes things easier for us.

We can train machine learning algorithms by providing them with large amounts of data and let them explore the data, build models and automatically predict the required outputs. The performance of machine learning algorithms depends on the amount of data, and it can be determined by the cost function. With the help of machine learning, we can save both time and money.

Importance of Machine Learning

The importance of machine learning can be easily understood from its use cases. Currently, machine learning is used in self-driving cars, cyber fraud detection, facial recognition, and friend suggestions by Facebook. Various top companies like Netflix and Amazon have built machine learning models that are using huge amounts of data to analyze user interest and recommend products accordingly.

Classification of Machine Learning

Three types of machine learning-

1-Supervised study

2-Uncontrolled Education

3-reinforcement learning

1- Supervised Study

Supervised learning is a type of machine learning method in which we provide sample labeled data to train the machine learning system and on that basis it predicts the output.

2- Unsupervised Learning

Unsupervised learning is a learning method in which the machine learns without any supervision.

3- Reinforcement Learning

Reinforcement learning is a feedback-based learning method, in which a learning agent receives a reward for each correct action and a penalty for each incorrect action. The agent automatically learns from these feedbacks and improves its performance. In reinforcement learning, the agent interacts with the environment and explores it. An agent aims to earn maximum reward points, and hence, improve its performance.

Prerequisites for Machine Learning

For those interested in learning beyond machine learning, there are certain requirements that must be met in order to be successful in this field. These requirements include:

- Basic knowledge of programming languages like Python, R, Java, Javascript etc.
- Intermediate knowledge of statistics and probability.
- Basic knowledge of linear algebra. In a linear regression model, a line is drawn through all the data points, and that line is used to calculate new values.
- Knowledge of cleaning and structuring raw data into desired format to reduce the time taken in decision making.

Machine Learning Applications

Augmentation—Machine learning that assists humans in their daily tasks, either personally or professionally, without complete control over the output. This type of machine learning is used in different ways such as virtual assistants, data analysis, software solutions. The primary user is to reduce errors caused by human bias.

Automation – Machine learning that works completely autonomously in any area without the need for any human intervention. For example, robots performing essential process steps in manufacturing plants.

Finance Industry – Machine learning is growing in popularity in the finance industry. Banks are using ML primarily to find patterns inside data, but also to prevent fraud. Government organizations – Governments use machine learning to manage public safety and utilities.

Machine learning issues

“Machine Learning” is one of the most popular technologies among all data scientists and machine learning enthusiasts. It is the most effective artificial intelligence technology that helps to build automatic learning systems to make future decisions without being programmed continuously. It can be thought of as an algorithm that automatically builds various computer software using past experience and training data. This can be seen in every industry, such as healthcare, education, finance, automobile, marketing, shipping, infrastructure, automation, etc. Almost all the big companies like Amazon, Facebook, Google, Adobe, etc are using various machine learning techniques. To grow their businesses. But everything in this world has bright and dark sides. Similarly, machine learning offers great opportunities, but some issues need to be addressed.

Conclusion

Machine learning has many subtleties and pitfalls, and many ways to stray from what appears to be a perfectly well-thinking machine. Almost every part of the basic principle can be played with and changed endlessly, and the results are often fascinating. Many develop into new fields of study that are better suited to particular problems. Machine learning is an incredibly powerful tool. In the years to come, it promises to open up a

whole new world of opportunities as well as helping solve some of our most pressing problems. Machine learning engineers are in ever-increasing demand, offering an incredible opportunity to be a part of something big.

Reference

- J.; Niu, H.; Carrasco, J.; Lennox, B.; Arvin, F., "Voronoi-Based Multi-Robot Autonomous Exploration in Unknown Environments via Deep Reinforcement Learning", IEEE Transactions on Vehicle Technology, 2020.
- Yosefzadeh-Najfabadi, Mohsen; Hugh, Earl; Tulpan, Dan; Sulick, John; Eskandari, Milad (2021). "Application of Machine Learning Algorithms in Plant Breeding: Yield Prediction from Hyperspectral Reflectance in Soybean?" , front. Plant Sci. 11: 624273. DOI: 10.3389/fpls.2020.624273. PMC 7835636. PMID 33510761.
- Bishop, C. M. (2006), Pattern Recognition and Machine Learning, Springer, ISBN 978-0-387-31073-2
- Machine learning and pattern recognition "can be viewed as two aspects of the same field." [5] : VII
- Friedman, Jerome H. (nineteen ninety eight). "Data Mining and Statistics: What's the Connection?". Computing Science and Statistics. 29(1): 3–9.
- "What is Machine Learning?" , www. IBM.com. Retrieved 2021-08-15.
- Zhou, Victor (2019-12-20). "Machine Learning for Beginners: An Introduction to Neural Networks". medium . Retrieved 2021-08-15.
- Domingos 2015, Chapter 6, Chapter 7.
- Ethem Elpedin (2020). Introduction to Machine Learning (4th ed.). MIT. pp. xix, 1–3, 13–18. ISBN 978-0262043793.
- Samuel, Arthur (1959). "Some Studies in Machine Learning Using the Game of Checkers". IBM Journal of Research and Development. 3(3): 210–229. siteserx 10.1.1.368.2254. DOI: 10.1147/rd.33.0210.

- R. Kohavi and F. Provost, "Glossary of Terms," Machine Learning, Vol. 30, no. 2–3, pp. 271–274, 1998.
- Gerovich, Slava (9 April 2015). "How the Computer Got Its Revenge on the Soviet Union". Nautilus. Retrieved 19 September 2021.
- Lindsay, Richard P. (1 September 1964). "Impact of automation on public administration". Western Political Quarterly. 17(3):78-81. doi: 10.1177/106591296401700364. ISSN 0043-4078. S2 CID 154021253 . Retrieved 6 October 2021.
- "Science: The Goof Button," Time (magazine), 18 August 1961.
- Nielsen N. Learning Machines, McGraw Hill, 1965.
- Duda, R., Hart P. Pattern recognition and scene analysis, Wiley Interscience, 1973

