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Review paper on machine learning in the stock market.

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K.K. Wagh Institute of Engineering Education and Research, Nashik Machine Learning Algorithms : A Conceptual ReviewMachine Learning Algorithms : A Conceptual Review

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Abstract

Using machine learning algorithm our aim is to predict and analyze the stock market.Recently stock market has become a source of second income for many households ,especially after the pandemic.Trading in stock market has become one of the most important activity in the finance sector.Various financial giants have been doing research in this field.As we enter an era characterized by unprecedented data availability, increased computational power, and sophisticated algorithms, the role of ML in the stock market is poised to grow even further. In this paper, we aim to provide a comprehensive overview of the current landscape of ML applications in stock trading and investment, shedding light on the benefits, challenges, and potential future developments.

Keywords:

Machine learning(ML),Stock market,Artificial intelligence(AI),Regression Algorithm,Neural networks,Random forest, Ensemble learning,Graph theory,decision tree method,Gaussian naïve Bayes,machine learning algorithms,etc.

Introduction

1.1 About machine learning(ML): Machine learning(ML) is a sub field of artificial intelligence(AI). It provides powerful tools to analyze data,predict trends and optimize strategies.It can also make predictions or decisions without being explicitly programmed.This technology has transformed numerous industries, from healthcare and finance to entertainment and transportation, by automating complex tasks and extracting valuable insights from vast datasets.

In traditional programming humans take all the decisions by explicitly coding the process.Machine learning uses algorithms and statistical models to improve their performance automatically by processing more data.This ability to learn and adapt makes ML a powerful tool for solving a wide range of problems, from image recognition and natural language processing to recommendation systems and autonomous vehicles. Machine learning is grounded in statistics, mathematics, and computer science, and it encompasses various techniques, including supervised learning (where models are trained on labeled data), unsupervised learning (which deals with unlabeled data and discovering hidden patterns), and reinforcement learning (focused on making sequential decisions to maximize rewards). As ML continues to advance, its applications continue to grow, making it an integral part of our modern technological landscape. This introductory journey into machine learning will explore its key concepts, applications, and significance in today's data-driven world.

1.2 About Stock market:

Stock market is a platform where individuals and institutions come together to buy and sell shares of publicly traded companies. This exchange of ownership is the central mechanism for raising capitaland is pivotal for economic growth.

At its core, the stock market is a marketplace where individuals can acquire ownership stakes in businesses, providing those businesses with funds to invest in growth, research, and development. In return, investors hope to profit from the company's success,

primarily through the appreciation of their stock's value and the distribution of dividends.

Related work

In paper [2] we get to know about the steps of how any machine learning software functions.It also highlights various different machine learning algorithms .These various algorithms are used in different cases on different data sets .According to their advantages they are given their data-sets accordingly.They analyzed and predicted the stock using

Supervised machine learning technique i.e., classification and regression algorithms on real world dataset.They found out that Algorithms in which one of classification and two is of regression methods is used for predictive analytics are implemented. Form the experimental results it was observed that Regression algorithms beaten in terms of accuracy over

the Classification learning algorithms. Paper [3] gives us insights on how to build a machine learning model using ensemble learning of machine learning,graph theory and deep learning models.This paper explains us about machine learning ,graph theory,deep learning,collecting and managing data sets.This paper also explores the traditional models and approaches to build a statistical model.This paper proposed a novel approach for forecasting stock prices using graphs and leveraging the Spatio-temporal relationship among the companies and its stock prices. Paper [4] results demonstrate that the neural network investment strategy has positive expected returns for many future varieties, and the returns are considerable and stable after combining multiple varieties. From another perspective, the neural network structure and strategy given in this paper only adopt the information of the daily rate of return, resulting in the omission of much other information, such as the absolute value of the price, the opening price, the daily highest price, and the daily lowest price. this paper discuss about the principles ,design models etc of neural networks. In paper [5] we get to know different ways to predict the random walk of stock market.Various different methods are used to predict the random walk of stock market in this paper like yield curve,naive bayes and decision tree model. The main learning methods that this paper has taken into consideration is the decision tree method and Gaussian naïve Bayes machine learning algorithm. The success rate on each method is high due to the capacity of each to perform different tasks. For instance, the Gaussian naïve Bayes machine learning algorithm has better scaling on min-max scores and the decision tree allows for data validation and have better results. All the machine learning algorithms which are used mostly in these prediction systems have their own models,techniques,functionality, advantages and disadvantages.All these aspects of machine learning algorithms are clearly mentioned in paper [1].This paper states Un supervising learning would deliver finer accuracy and outcomes for big size of datasets.

Conclusion

Financial firms are increasingly leveraging artificial intelligence (AI), machine learning (ML), and predictive analytics to navigate the volatile nature of the stock market.The quantitative investment system will definitely generate huge potential and space in the future investment field. Despite the massive potential of ML-based stock price prediction, this technology is far from perfect. The effectiveness of ML-based systems depends on the quality of the information they are trained with. Therefore, insufficiently representative datasets could lead to bias.Also stock market are chaotic and many unnatural scenarios are very difficult to predict.Thirdly any winning strategy cannot last if everyone uses it.Therefore most of the top Financials giants keep their winning strategies a secret. In conclusion machine learning algorithms are of great help to predict the movement of stock market to a certain accuracy.But it is far from being completely reliant on yet.

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