ICEST-2K24 [International Conference on Engineering, Science and Technology]
In Association with
International Journal of Scientific Research in Science, Engineering and Technology
Print ISSN - 2395-1990 | Online ISSN : 2394-4099 (www.ijsrset.com)

Algorithmic Trading : An Overview

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ABSTRACT
Stock prediction is a popular research topic with experts from various fields such as business, economics, mathematics, and computer science exploring potential solutions to glitches that can affect accuracy. While predicting the stock market remains a challenging task due to its complex and often random nature, millions of investors worldwide engage in this activity daily. Predictive models that leverage supervised machine learning techniques offer considerable value to decision-makers seeking to make informed decisions regarding stock market investments. This paper reviews recent research on supervised machine learning models for stock market forecasting, with a focus on the most commonly used techniques such as support vector machines, artificial neural networks, K-nearest neighbors, naive Bayes, random forest, linear regression, and support vector regression. Promising results have been achieved with these approaches, empowering investors and decision-makers to make effective and informed choices.
Keywords: Supervised Machine Learning, Classification, Regression, Support Vector Machine (SVM), Artificial Neural Network (ANN), Stock Market Prediction

I. INTRODUCTION

Stock prediction is a challenging field that draws researchers from diverse areas like economics, business administration, arithmetic, and computer science. Accurate share price predictions have the potential to generate significant profits, hence, this area has received critical attention for years. However, forecasting the stock market is a difficult task, primarily due to the inherent volatility and random behaviour of equity time series. Financial analysts face many challenges in this arena, including the need to make effective investment decisions while minimizing risks. Recent technological advancements have made the stock market more accessible to investors, leading to the development of various models for market forecasting, including machine learning, data mining, and statistical models. Despite the complexity of financial markets, researchers continue to strive for better understanding and predictability.

II. RELATED WORK

The focus of our work is to conduct a thorough investigation into both fundamental and technical analysis in predicting stock market trends, particularly in relation to market economies and stock prices. Our research centres around the financial market as the pivotal point, drawing on the findings of previous studies

(Nassirtoussi et al. 2014, Gocken et al. 2016). Therefore, gaining a comprehensive understanding of the financial market is crucial and indispensable [1].

The utilization of machine learning techniques for predicting the stock market is gaining popularity worldwide. It has been observed that these techniques are much more efficient and faster compared to traditional prediction methods. Therefore, machine learning is increasingly being applied for stock market prediction due to its superior accuracy and efficiency.[2]

The financial market is characterized by dynamic, sensitive, nonlinear, and chaotic stock market prices. To predict the abrupt stochastic variations of the market, a novel hybrid model has been proposed that combines the strengths of fractional order derivative and deep learning techniques such as long-short term memory (LSTM) networks. The dynamical features of this model make it particularly effective for predicting the unpredictable behaviour of the financial market.[3]

In a financially volatile market such as the stock market, accurate predictions of future trends are crucial. Given the financial crisis and the importance of scoring profits, it is essential to have a reliable forecast of stock values. Advanced machine learning algorithms are required for predicting non-linear signals in the market. Therefore, accurate predictions using such techniques are necessary to ensure the security of financial investments.[4]

This paper reviews various studies on supervised machine learning models used in predicting the stock market. The discussion focuses on how these techniques can enhance the accuracy of stock market predictions. Among the different supervised machine learning methods, Support Vector Machine (SVM) is the most commonly used technique for stock price prediction, mainly due to its superior performance and accuracy in this domain. [5]

Machine learning techniques are being extensively utilized for stock market prediction worldwide. These techniques are demonstrating greater accuracy and speed compared to traditional prediction methods. Therefore, the application of machine learning techniques for stock market prediction is increasingly gaining popularity.[6]

This paper presents the prediction of stock prices for five companies listed on India's National Stock Exchange (NSE) using two models: the Long Short-Term Memory (LSTM) model and the Generative Adversarial Network (GAN) model. The GAN model employs LSTM as the generator and a simple dense neural network as the discriminant. The study focuses on predicting the stock prices of these companies using these models.[7]

III.EXISTING SYSTEM/OPEN ISSUES

The application of data mining techniques has made the use of stock market analysis more prevalent in recent years. While fundamental analysis has been a common approach for stock prediction, research shows that text mining has several associated problems that can impact the effectiveness and efficiency of decision-making. In their work titled "Text Mining-Techniques Applications and Issues," the authors argue that the text mining process faces various challenges that could affect its outcomes. One critical issue is the dependency on multi-lingual text minor changes, which can create problems in analysis.

IV.CONCLUSION

Research indicates that Artificial Neural Network (ANN) and Support Vector Machine (SVM) are the most commonly used machine learning algorithms for stock prediction. However, ongoing research is focusing on improving stock prediction accuracy using hybrid ensemble machine learning methods. Studies suggest that

considering both internal and external factors can lead to more precise and accurate stock prediction. It is noteworthy that the African market has received relatively little attention in terms of stock prediction research, despite the volume of articles on this topic.

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