



Stock Market Protection and Prediction Using Blockchain and Machine Learning

Alon Abraham A¹, Mukunthan A R², Rohan Balakrishnan R³, Dr. M. Pachhaialmmal@Priya⁴

^{1,2,3}UG - Computer and Communication Engineering, Sri Sairam Institute of Technology, Chennai, Tamil Nadu, India.

⁴Head of the Department - Computer and Communication Engineering, Sri Sairam Institute of Technology, Chennai, Tamil Nadu, India.

Email **ID:** alonabraham7@gmail.com¹, mukunthan.1255@gmail.com²,
rohanbalakrishnan41211@gmail.com³, hod.cce@sairamit.edu.in⁴

Abstract

This project aims to enhance stock price prediction and market protection by combining machine learning and blockchain technology. The accuracy and reliability of stock price predictions are improved by training machine learning algorithms on a large amount of historical data, using blockchain technology to monitor transparent sources of funds. Integrating machine learning enables the detection of hidden patterns and correlations that lead to stock price movements and helps in Real-time analysis and instant decision-making. In the meantime, there is a record of price data that can be maintained and audited by blockchain technology without any risk of manipulation. The project benefits investors by optimizing investment strategies and improving financial outcomes. The Blockchain will enhance trust and integrity in financial markets by providing reliable, accessible price data. Combining machine learning with blockchain offers promising possibilities for accurate and transparent stock market forecasts, improved decision-making processes, and empowerment of individuals within the financial ecosystem.

Keywords: Machine Learning, Blockchain, Transparent, Forecasts.

1. Introduction

In recent times, financial investors have suffered a great loss of more than 5.8 billion dollars due to internal policies and uncovered policies in 2021, Which is 70% more than the previous year. Over 2.8 million people filed a fraud complaint. Imposter scams were the most prevalent, but investment scams cost the typical the victim the most money. To combat this situation, we proposed an innovative solution or software model that provides total transparency in the market. The creation of a thorough transparency the software model is suggested as a revolutionary response to the industry's growing financial losses and fraud concerns. This cutting-edge solution combines machine learning algorithms for adaptive fraud detection, blockchain technology for safe transactions, smart contracts to enforce predetermined regulations, and real-time data monitoring. In addition to instructional materials

to raise awareness, investors have secure access to up-to-date information thanks to strengthened user authentication procedures and open communication channels. Compliance is ensured through cooperation with regulatory agencies, and problems are quickly resolved using an incident response system. This software paradigm, which places a strong emphasis on community involvement and ongoing improvement intends to transform the financial industry by promoting transparency, reducing risks, and safeguarding investors from both internal and external threats. when you do not understand them

2. Ease of Use

2.1. BlockChain Integration

As a result of our product's integration with blockchain, the government can easily trace the sources of corruption. The User may be informed via the public ledger about the mishap caused. [12]

2.2. Machine Learning Integration

This study explores the application of machine learning techniques for predicting the stock market movements. With the increasing availability of financial data and advancements in computational power, machine learning algorithms offer promising avenues for enhancing trading strategies. This abstract outlines the key methodologies and findings of the research, including the selection of relevant features, model training, and evaluation metrics employed. Through analyzing historical stock data, our study demonstrates the effectiveness of machine learning models in forecasting price trends and identifying profitable trading opportunities. Furthermore, we discuss the challenges and limitations associated with this approach, such as data quality issues and market volatility. Insights this research contributes to the ongoing discourse on the integration of artificial intelligence in financial markets and provide valuable guidance for investors and practitioners seeking to leverage machine learning for informed decision-making in stock trading. [13]

3. Literature Survey

[1].To ensure the identification of real products throughout the supply chain, a functional blockchain technology is used to prevent product counterfeiting. By using blockchain technology, consumers do not need to rely on trusted third parties to safely know the source of the purchased product. [2].Blockchain technology is employed in the supply chain to combat product counterfeiting, ensuring the reliable identification of authentic products. This eliminates the dependence on third parties for source verification, providing consumers with a secure and direct way to verify the origin of their purchased products. [3].It aims to analyze the portability of various integrated stock selection models based on different feature selection and stock price trend prediction algorithms. The original features are altered by feature selection methods. The Time-sliding window method is applied for cross-validation to determine the parameters of stock price trend prediction algorithms, which makes the model more practical in actual investment transactions. [4]This article summarizes the shortcomings of traditional supply chain finance based on previous

work experience. The author discusses the research on blockchain-based supply chain financial big data tamper-proof simulation algorithms from four aspects: financial big data feature evaluation criteria, financial big data key feature extraction, supply chain financial big data key feature anti-tampering methods [5] This article succinctly outlines the utilization of blockchain technology in stock exchanges. Originally associated with cryptocurrencies, blockchain is now explored for its potential to revolutionize traditional financial systems, offering benefits like heightened transparency, increased security, quicker settlement times, and lower transaction costs in stock exchanges. The overview focuses on key applications, such as trade settlement, clearing processes, shareholder voting, and securities issuance, while also addressing challenges and opportunities within the regulated stock trading landscape. [14]

4. Methodology

In this paper, we develop a blockchain model that helps to keep the market secure and safe from fraudulent attacks. We combine the market with the ML prediction model to make the market stable and sustainable. Making them more flexible in terms of safety and prediction. Integration of blockchain in a particular share and maintaining it in a ledger. All the transactions that happen with the stock are noted in a blockchain ledger. The ledger details are distributed in a public community. So every contributor in the ledger has a copy of the transaction details. So the node details can't be changed thus security in the market is maintained. In the ML algorithm, we use SVM (Support Vector Machine) to predict the price movements as it is highly stable in predicting results. Thus maintaining consistency (Figure 1,2) [15]

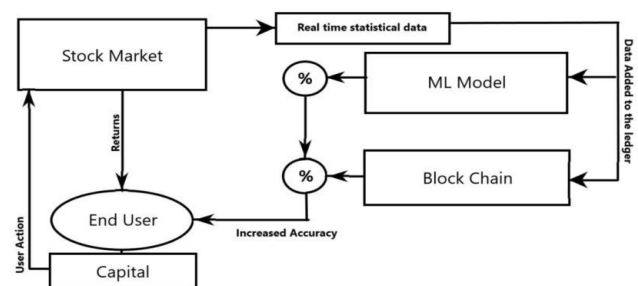


Figure 1 Block Diagram



Figure 2 Dataflow Diagram

By combining these two concepts we hence provide security in the market. By using the ML algorithm consistency in market prediction can be maintained. But blockchain is also used to check the stability of the share in the market. This technique is achieved by calculating in majority share players and stockholders in the market. By using we can predict the stability of the share value in the market. Hence this methodology can be used to predict the share values and provide transparency in the market. Hence making the market a better place to be. [16]

5. Modules Used

5.1. SVM Algorithm

Support Vector Machines (SVM) are robust supervised learning algorithms widely utilized in stock price prediction due to their ability to discern complex patterns in data. In the context of stock market forecasting, SVM analyzes historical stock data, incorporating features such as prices, trading volumes, and technical indicators like moving averages and the relative strength index (RSI). Through preprocessing to handle noise and missing values, as well as feature selection for relevant indicators, SVMs aim to train a model that accurately predicts future price movements. The training process involves finding the optimal hyperplane that segregates different classes of data points, such as "buy," "sell," or "hold." Post-training, the model's performance is assessed using evaluation metrics like accuracy percentage, which measures the model's ability to correctly predict stock price movements on unseen data. SVM's effectiveness in capturing intricate patterns and trends in historical stock data

makes it a valuable tool in the realm of stock market prediction. Furthermore, SVMs can handle both linear and non-linear relationships between features and target variables. By using kernel functions, SVMs can map input data into higher-dimensional feature spaces, allowing for the identification of complex relationships that may not be linearly separable in the original feature space. This flexibility enables SVMs to capture a wide range of patterns and trends in historical stock data, enhancing their predictive ability capabilities.

5.2. Blockchain Ledger

The incorporation of public ledger technology, known as blockchain, has attracted significant interest in its potential application in stock market prediction and protection. The transparency and decentralization of blockchain technology provides important benefits for improving the accuracy and transparency of stock data. Financial organizations can minimize the risk of fraud and manipulation by securely recording and timestamping transactions about stock trades, dividends, and other market activity by utilizing blockchain's distributed and unchangeable ledger. Additionally, decentralized prediction markets can be established through blockchain-based systems, enabling users to forecast future stock values and market movements. By automating the wagering and settlement processes, these prediction markets utilize smart contracts, which may provide valuable insights into future market trends. Blockchain technology also reduces the danger of identity theft and unlawful transactions by strengthening investor protection with strong identity verification and authentication processes. Additionally, by giving authorities instant access to transparent and auditable transaction data, blockchain-based solutions expedite regulatory compliance procedures and improve the effectiveness of regulatory requirements enforcement and monitoring. While blockchain's adoption in the stock market industry has hurdles, continuous research and development activities are examining its potential to change the stock market prediction and protection, providing investors and market players with increased transparency, security, and efficiency (Figure 3,4,5,6,7) [15-17]

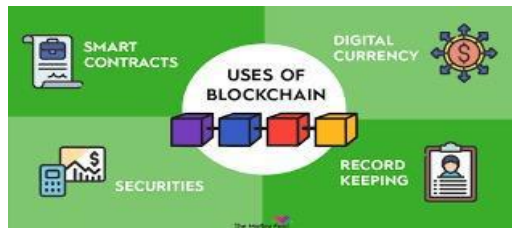


Figure 3 Features of Blockchain

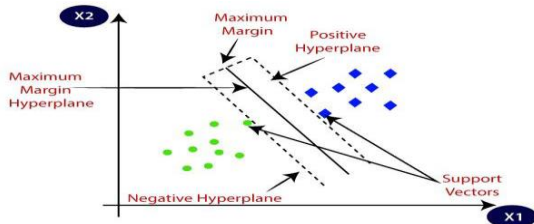


Figure 4 Predictive Model

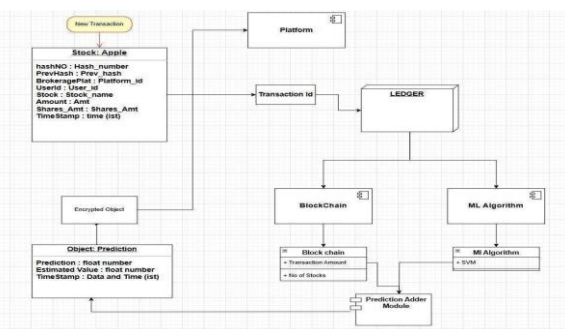


Figure 5 UML Diagram

6. Output

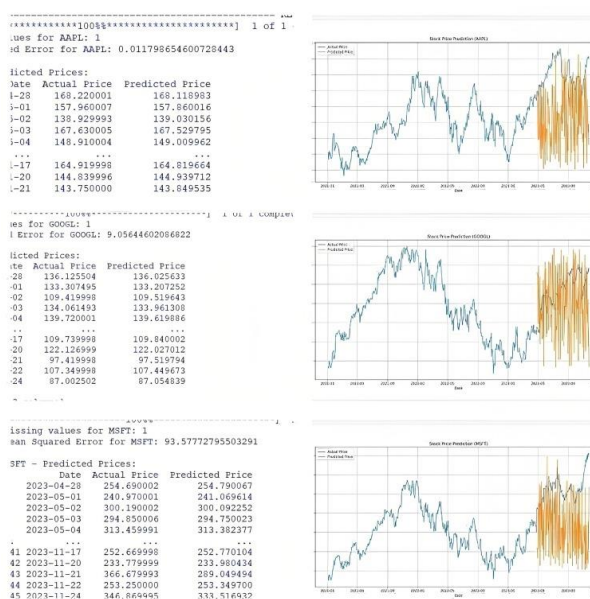


Figure 6 Predicted Output of Stock Prices

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>>>
===== RESTART: C:/Users/alona/OneDrive/Documents/LIVE-IN LAB/LIL-III/block.py =====
Index: 0
Timestamp: 2023-12-22 00:54:34.613913
Data: Genesis Block
Hash: 063ed17afdba7d4acc3fc79ed0e553e9ea242b7bf4e30d5478ca6d93ed546f8e
Previous Hash: 0

Index: 1
Timestamp: 2023-12-22 00:54:35.231347
Data: {'Symbol': 'AAPL', 'StockValue': 193.85000610351562}
Hash: blc791fe8e125cc6a531addf063b0da5e049a31334f8a638979521636486e8d7
Hash: 42fbf53c4956d58d0f6d432cdadac87c3eb1693030d737d73049aeecc54aa1283
Previous Hash: 063ed17afdba7d4acc3fc79ed0e553e9ea242b7bf4e30d5478ca6d93ed546f8e

Index: 2
Timestamp: 2023-12-22 00:54:35.283804
Data: {'Symbol': 'GOOGL', 'StockValue': 139.77499389648438}
Hash: 24712bd6ba52edd9ee2ec6c704fa6b1cfac98e002fad745473f109939b8f9cd
Previous Hash: blc791fe8e125cc6a531addf063b0da5e049a31334f8a638979521636486e8d7

Index: 3
Timestamp: 2023-12-22 00:54:35.369888
Data: {'Symbol': 'MSFT', 'StockValue': 371.6700134277344}
Hash: 8819899497cba0e014e0608bb097f2e966e306d8da7d3144970efa6077611eb8
Previous Hash: 24712bd6ba52edd9ee2ec6c704fa6b1cfac98e002fad745473f109939b8f9cd

Index: 4
Timestamp: 2023-12-22 00:54:35.421946
Data: {'Symbol': 'AMZN', 'StockValue': 152.99000549316406}
Hash: 8819899497cba0e014e0608bb097f2e966e306d8da7d3144970efa6077611eb8
Previous Hash: 42fbf53c4956d58d0f6d432cdadac87c3eb1693030d737d73049aeecc54aa1283

>>>
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Figure 7 Data Nodes Stock Prices

Conclusion

In summary, the project proposes a holistic solution merging blockchain technology and Support Vector Machines (SVM) for heightened stock market protection and prediction. The integration capitalizes on blockchain's security and transparency features, employing a distributed ledger and smart contracts, complemented by SVM's predictive analytics prowess. The approach ensures tamper-resistant financial transactions, automated rule enforcement, and accurate stock price forecasts. By replacing LSTM with SVM, the project adapts its machine-learning methodology for tailored stock market analysis. This comprehensive strategy, augmented by decentralized identity solutions aspires to establish a secure, transparent, and predictive financial ecosystem, fostering confidence and efficiency among market participants. [18-20]

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