

Artificial Intelligence and Its Role in Stock Market

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Abstract

AI-powered modern trading systems utilize algorithms to assess and predict movements in the stock market, providing investors with valuable information. Stock markets are not an exception; AI is taking over all sectors of trade. The ability to rapidly calculate large numbers and record how markets change in a fraction of a second revolutionized financial trading. Today, AI is driving a new wave of innovation that is transforming capital markets. With the advent of technology, however, trading and investing became significantly easier and more varied. Artificial intelligence in trading, or AI trading, refers to a trading system that uses algorithms for quantitative trading with technical analysis using automated algorithms. Hedge funds, investment firms and stock investors can use artificial intelligence trading. With the development of AI techniques and contributions from businesses, there are still several ways that an investor can benefit from AI and achieve future financial objectives. The adoption of AI is not just a fad; it is essential for any investor who wants to stay competitive in a market environment that is becoming increasingly data-driven and competitive.

Keywords: algorithms, predict movements, revolutionized and financial trading

Introduction

The second wave of financial innovation involves Artificial Intelligence, which has transformed capital markets. Traders used stock analysts and media coverage to make investor decisions, but online trading platforms democratized markets by eliminating exorbitant brokerage fees. AI-powered modern trading systems utilize algorithms to assess and predict movements in the stock market, providing investors with valuable information. Stock markets are not an exception; AI is taking over all sectors of trade. The ability to rapidly calculate large numbers and record how markets change in a fraction of a second revolutionized financial

trading. Today, AI is driving a new wave of innovation that is transforming capital markets. With the advent of technology, however, trading and investing became significantly easier and more varied.

Back before online trading platforms and investing apps became available, traders looked to media coverage, research analysts, and stock experts for information on how to make investments. While relying on research analysts was still an option, fundamental and technical analysis became crucial as more time was invested in the financial market. The advent of online trading platforms marked a major shift that began changing the face of trading and investing during the 2000. Most industries will experience their next phases of innovation through AI. Consider quickly reviewing stocks and sorting.

Objectives of The Study

1. To study the role of Artificial Intelligence plays in predicting the stock market.
2. To study Artificial Intelligence and its impact in stock market prediction.
3. To explore the Artificial Intelligence tools/ software implemented in the stock market.
4. To study the risks and challenges of Artificial Intelligence in predicting the stock market.

Role of AI in Stock Market

Stocks traded via artificial intelligence employ machine learning, sentiment analysis and sophisticated algorithmic predictions to analyze millions of data points and execute trades at the best price possible. AI traders also make accurate and efficient forecasts about markets to mitigate risk and offer higher yields. When stock investors rely on a pre-programmed series of instructions to make trading decisions based on past or historical data, it is referred to as algo-trading or algorithmic trading. Artificial intelligence in trading, or AI trading, refers to a trading system that uses algorithms for quantitative trading with technical analysis using automated algorithms. Hedge funds, investment firms and stock investors can use artificial intelligence trading.

Benefits of AI in Stock Trading

The following are the benefits of using artificial intelligence in stock market trading:

1. **Faster Research Time with Better Results:** In one survey it was determined that traders who used algorithmic trading saw a 10 percent boost in productivity, as AI

trading automates research and data-driven decision making, allowing investment firms to spend more time advising their clients and less time conducting research, with additional benefits of reduced human error, increased accuracy, as AI trading uses historical financial data to inform its decisions.

2. **Predicting Trends:** An AI trading system can also collect information from news sources and social media to identify market movements by analyzing sentiment using natural language processing (NLP) techniques for extracting text and linguistics to discover patterns in subjective content.
3. **Financially Efficient:** While it will cost money to implement and maintain an AI system, companies and investors will pay less in administrative costs over time, and AI systems can continually monitor data.

Implications of AI in Stock Market Prediction

Stock markets have an infamous reputation for being volatile and unpredictable; there is no trend to be found in them as they change all the time due to politics, the global economy, unexpected events, or even how well a company does financially. The application of many different types of analysis are constantly used by researchers, data scientists, and financial professionals to seek out trends in stock markets, and artificial intelligence is playing an increasingly large role in the stock market with technology advancement; machine learning algorithms can process massive amounts of financial data for pattern recognition that will predict future stock prices.

Algorithms to Predict Stock Price

We can grasp how algorithms are built and run without needing a profound comprehension, thanks to academic research and reports from professional organizations. The 2022 article "Machine Learning Approaches in Stock Price Prediction" published by the UK Institute of Physics (IOP) analyzed various predictions related to stock prices.

Traditional Approach

- Traditional algorithms are more accurate with large data sets and diverse models. Some ML systems work better with historical data, while others work better with mood data. When combined, their potential can be increased. These systems may be too sensitive to

extremes and unable to detect anomalies or rare events. There have been numerous machine learning techniques and approaches developed by researchers:

- Random Forest is a very fast algorithm that will yield high accuracy on big datasets. Regression analysis identifies relationships between different variables, which are commonly used in stock prediction.
- Naive Bayesian Classifier is a simple and effective method for analyzing smaller financial data sets, determining the probability that one event affects another.
- K-nearest Neighbor is a distance-based computationally intensive approach to predicting an outcome of an event.

Deep Learning

- Deep learning (DL) is a form of advanced machine learning that can process more information than standard ML systems, using artificial neural networks (ANNs). ANNs are complex networks of artificial neurons that communicate through information transfer between layers of units. These units are grouped into input, output, and secret layers.
- While the basic neural network may have only a few layers, deep neural networks with hundreds of layers analyze enormous amounts of data, each layer identifying patterns to provide more abstraction.
- As data is processed, each successive layer finds trends and provides more abstraction. Long short-term memory, considered the most effective Deep Learning system for stock prediction.

AI Implemented in Stock Market

By simplifying its complexity and range, artificial intelligence and machine learning can help make the difficult task of analyzing the stock market more achievable. Additionally, machine learning and artificial intelligence can assist in gathering data, analyzing stocks, and identifying patterns. Here are some of the top artificial intelligence tools for stock trading.

1. The program is using AI called Sigmoidal, which is used to identify correlations between assets and learn how the capital markets are likely to behave.
2. The company provides artificial intelligence and robotic process automation services for the whole product development process from ideation through delivery.
3. This technology simplifies analyzing prospective investments to aid in decision-making.

4. Trade Ideas Full Quote Windows helps you see a stock price by bringing up a window with all of the major data that goes into the stock, as well as predefined layouts and your channels.
5. Signal Stack automates the trades similar to how top hedge funds do so to even the playing field.
6. This infrastructure is for large enterprises. Signal Stack allows you to quickly place an order in a brokerage account by responding to an alert on any trading platform. Algorithmic trend analysis, Trend Spider.

Risks of Artificial Intelligence

AI trading systems are still vulnerable to market dangers despite increased efficiency.

1. **Opacity:** Some AI systems use complex analysis and techniques that are hard to decipher.
2. **Data bias and fitting:** It is important for the quality of the data used in AI stock trading; how well it fits the system will dictate the quality of the result.
3. **Lack of human supervision:** The system makes trades based on preprogrammed rules, which may not account for sudden market shifts and cause large errors.
4. **Overreliance on historical data:** Historical data is heavily relied upon by the system, so if the market environment has changed drastically, the model will not work as well.

Challenges of AI in Stock Market Prediction

- The stock market is a complex system with numerous factors, some within our control (economic data, political developments), and some not (calamities). On one hand, AI has the ability to crunch through tons of information and identify patterns that would otherwise escape human attention. On the other hand, it cannot predict when an unexpected event occurs that will have a major impact on the market.
- Potential overconfidence in AI predictions another challenge is overreliance on AI predictions. While AI can provide useful information to owners and help they make more informed financial decisions, it is not perfect, and no single source of data should be used

exclusively when making financial decisions. It is always important to have multiple sources of data and never rely solely on one source while making a decision.

- Continual human monitoring and intervention and lastly, continual human monitoring and intervention are needed. While AI can handle many aspects of stock market research, humans must step in to monitor and intervene.

Conclusion

As technology has changed trade activities, so too does artificial intelligence (AI) play an integral role in transforming these activities. The democratization of trading in India due to AI-powered trading platforms allows retail investors to use analytics to research firms, industries, or indices; indeed the integration of AI into investing has transformed and brought new tools to the table for investors to aid them with their decision-making. With the development of AI techniques and contributions from businesses, there are still several ways that an investor can benefit from AI and achieve future financial objectives. The adoption of AI is not just a fad; it is essential for any investor who wants to stay competitive in a market environment that is becoming increasingly data-driven and competitive.

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