RESEARCH ARTICLE

Application Analysis of Financial Investment Based on Machine Learning

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Abstract: Machine learning has great potential in reducing product and service costs, speeding up business processes and serving customers better. In this era of unprecedented development of technology, as one of the most important application fields, machine learning has also been widely used in financial investment. In view of this, this paper briefly discusses the connotation of machine learning, introduces the application of machine learning in financial investment, and lays the foundation for the future development of financial industry.

Keywords: machine learning; financial investment; application analysis

1. Introduction

Machine learning is regarded as one of the most subversive innovations in today's enterprises, and it is also a powerful promoter of competitive advantage. Although machine learning has existed for many years, it has only recently shown great potential to promote economic and social development. Health care, banking, manufacturing and transportation are just some industries affected by machine learning. Besides, the emergence of three technologies has promoted the rapid application of machine learning in financial investment. With the social development and transformation promoting the transformation and innovation of enterprises, the application of machine learning is reaching its inflection point, promoting enterprises in many fields to obtain greater profits.

2. The concept of machine learning

Based on the emergence of big data and the progress of computer technology in processing and data storage, the research of machine learning has made great progress. As another important application field of artificial intelligence, the main purpose is to use computers to simulate human learning activities. As the application knows more about the data being processed, it can gradually improve its performance in specific tasks. Like many other applications, machine learning follows the development phase, the running phase and the output phase, and is used to identify existing knowledge, acquire new knowledge, and continuously improve performance to achieve self-improvement. On this basis, machine learning has three research objectives. First, build a cognitive model of human learning process. Second, construct a general learning algorithm. Third, construct a specific task-oriented learning model to promote the development and progress of machine learning.

At present, machine learning has become a new

discipline, and it has become an innovative course in colleges and universities by integrating a variety of learning methods and knowledge of various disciplines. The related application fields are constantly expanding, and some research results are beginning to be transformed into entities with practical significance. But a common challenge faced by machine learning is the trade-off between interpretability and accuracy. Many decisions based on machine learning need to be transparent and interpretable in order to understand the underlying decision logic. The paradox is that although many deep learning methods can produce highly accurate results, they often lack interpretability due to their black box nature. Therefore, managers need to consider the above balance when determining the most appropriate machine learning method for a specific application.

3. Machine learning in financial investment

At present, machine learning has been widely used in many fields, especially in financial investment, which can reduce the cost of bank operation by 20% to 25%, generate new income through products and services, and improve the ability to attract more customers.(Wu, 2022). By turning manual processes into intelligent and automated processes, financial institutions can concentrate their resources on higher-value activities, such as providing better products and services for customers and broadening the channels for acquiring customers. Therefore, the value of machine learning in financial investment is too numerous to mention, specifically.

3.1 Analyzing transaction scenarios and improve processing efficiency.

Use bank machine learning to analyze various trading scenarios, match product prices with values, and increase revenue. At the same time, it is widely used to collect customer transaction information online, which enables investment banks to efficiently process large data sets and make real-time forecasts for various automatic trading activities, such as buying and selling stocks, commodities and derivatives. On this basis, machine learning helps small and medium-sized banks to improve their business

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efficiency, including mortgage, loan and customer service, etc. through online platforms.

3.2 Carrying out daily transactions and predict investment behavior.

At present, more financial institutions use intelligent software such as robots to help customers perform daily banking transactions, and at the same time provide simple insights to improve financial management. At the same time, multiple machine learning applications are used to predict the investment behavior with the help of large data sets of millions of customers, so as to ensure that the rapid development of machine learning technology can catch up with the changes of the market and customers' needs and create the greatest value for financial institutions.

3.3 Stabilizing market fluctuations and meeting rational expectations.

In the financial field, the biggest function of machine learning is to stabilize the domestic market. In China's stock market, most retail investors are still in an instinctive or primitive investment mode, which is very sensitive to market fluctuations, while the stock price changes are unfavorable to the information transmission in the financial market. Therefore, with machine learning, investors' disadvantages in risk aversion can be made up, and their strategic design can far exceed the vision of ordinary investors, thus gaining greater economic benefits. Based on the deepening of machine learning in financial investment, the market will become more rational in the long run with the help of institutional investors' professional knowledge(Su, 2017).

4. The application of machine learning in financial investment

As far as the financial market is concerned, because of its own particularity, the research reports that can be retrieved at present are mostly presented from the perspective of sellers, while the information of buyers who really participate in market transactions is very limited, and their effective strategies are closely protected. Therefore, the research reports and academic articles seen now are only the tip of the iceberg in the application of machine learning in the financial field. Machine learning based on mathematical models and computer programs is booming in financial investment. With the advent of the era of big data, machine learning has attracted more and more attention from financial technology companies, and its specific applications in the field of financial investment are as follows.

4.1 Completing big data processing.

At present, the magnitude of data in the financial investment field is usually above PB level, which is a large amount of data that people can not directly count and analyze, and must be processed by cloud computing. Therefore, big data modeling can not be separated from machine learning, and common big data research in the field of financial investment includes completing the modeling and analysis services of the target company through massive financial news and financial statements, using machine learning model to identify effective information and predict market price trend, industry income, etc., so as to improve the effectiveness of existing business processes and maximize economic benefits through machine learning model.

4.2 Selecting the financial investment mode

In the field of financial quantitative investment, machine learning completes strategic optimization and risk management by processing raw data, constructing online deep learning model, and strengthening learning, and obtains investment signals. On this basis, it can be directly used for asset price prediction. Therefore, the financial investment needed in the era of big data is not only guided by simple statistical data, but also needs to analyze the neglected variable relationships in the previous big data sets more effectively through machine learning, so as to obtain better investment model guidance. For example, the deep learning model is used to predict the positive and negative returns of the stock, and the price range of the stock operation is determined according to the predicted results, so as to determine the trading strategy, select the stock and build the investment portfolio, and bring greater economic benefits to the enterprise.

4.3 Completing financial market forecast.

At present, machine learning can obtain financial market data and predict future events. For example, in the banking industry, machine learning applications are constantly looking for the best investment strategy and gradually automating financial services to capture effective signals that will affect future market performance. Some financial institutions have developed a proprietary machine learning model to find the best execution strategy for trading orders. Using historical data and algorithms to calculate the probability of the best performing trading orders, and executing them accordingly, so as to screen out the stocks with the highest predicted volatility, and using the traditional risk model to create a low-risk and high-yield portfolio, which can reduce the volatility after the event more than the existing risk model. At the same time, machine learning also contributes to preventive maintenance. It is mainly used to forecast and analyze the development trend and abnormal fluctuation risk of the industry, grasp the competitive advantage in time, and complete the market forecast.(Liu, 2021).

5. Conclusion

At present, machine learning is becoming an important part in the field of financial investment, and it gradually changes the market transaction mode and user demand, bringing competitive advantage to enterprises. In the future, with the explosive growth of financial-related data, with the improvement of new algorithms and the continuous optimization of artificial intelligence technology, the application of machine learning in the field of financial investment will become more and more important. Considering the trade-off between interpretability and accuracy of machine learning algorithms, although this technology has the potential to reduce costs and improve efficiency, managers should be prepared for various challenges in its design, implementation and operation.

Conflict of Interest

The authors declare that they have no conflicts of interest to this work.

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