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Automated Algo-trading System

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Abstract: *Algorithmic Trading is a process where a computer system is given specific orders to execute after certain conditions are met according to varying market conditions. Machine learning, Q-learning, Volatility based trading and Quantitative trading approaches are the various approaches used for algorithmic trading currently across various markets. Reinforcement learning and directional change are subsets of the Machine learning approach. Volatility based trading approach is famously used in cryptocurrency markets. Quantitative approach means using complex mathematical calculations to build trading models. We have adopted the quantitative approach for our automated trading system.*

Keywords: Algorithmic, Trading, Machine learning, Markets, Volatility, Cryptocurrency, Quantitative

I. INTRODUCTION

Major institutions have recently started using algorithmic trading, a type of electronic trading, to carry out automatic and high frequency trading in the financial markets. It employs a predetermined set of instructions created through the analysis of several types of data and a computer programme to carry out trades automatically. To examine different trading chances and take advantage of them, it essentially blends programming and financial markets. The trading process is also made more emotion-free by algorithmic trading, which rapidly and without hesitation puts orders.

II. LITERATURE REVIEW

2.1 Q-learning Approach (Grover 2021)

This work shows a new approach to the operation of Q-learning in the FOREX request, considered one of the most unpredictable markets. Unlike the other approaches in the stock market, this algorithm considers different market conditions involving an optimization function and time changing the prize and penalty limits, the slice frequency and the number of ages to be used in the trading ways. Therefore, the results presented easily show profit earnings, which, although they aren't truly high compared to share prices, considering former work in the FOREX request mentioned over, a high profit is achieved. Thus, the results of the proposed algorithm in the EUR/ USD and NZD/ JPY currencies show that this approach can be used as a great reverse testing tool, using it for the confirmation of strategies grounded on specialized news, styles and pointers similar to MACD or RSI. Well, for unborn work, the end is to apply the algorithm in real- time systems with scalping strategies in such a way that profit is maximized in lower time intervals, whether they are seconds or twinkles. It's also anticipated to be suitable to perform a multipoint vaticination in the vaticination with the current algorithm. Eventually, for an unborn perpetration it's recommended to use high volume coins able to move a high number of pips in the request through quick operations and at the same time to attach a sentiment analysis tool to this algorithm in a similar way that it's suitable to quantify the sentiments of request drivers.

2.2 Machine Learning Approach

The Wang 2019,Xucheng 2019 and Aloud 2021 papers are based on machine learning. In the Aloud 2021 paper, the authors propose two algorithmic trading strategies based on the DCRL model. The main focus was to improve the representation of terrain conditions for the RL algorithm. The dynamic DC threshold event approach was suitable to accurately represent the countries of the terrain. In addition, it was efficiently suited to captive countries with stable requests, resulting in profitable trading returns under respectable risk conditions across many stock indicators. The effectiveness and robustness of the DCRL trading strategies were confirmed on real stock request data, and experimental

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results demonstrate that the proposed DCRL algorithmic trading outperformed ZI, Direct RL and Classic DC trading strategies with enhanced total profit and SR as the further harmonized gain angle.

The Wang 2019 paper develops a data-driven algorithmic trading strategy for virtual deals in power requests. A budget and risk reduction portfolio optimization problem is formulated to select the virtual flings to be presented. A mixture of thick network models has been developed to read the value spread between DA and RT LMPs. Backcasting results with request data from ISO-NE show that the proposed MDN based algorithmic trading strategy is much more profitable than the standard OL approach. In the future, we will consider price sensitivity in portfolio optimization frames and develop machine literacy frames to seamlessly model price spreads across all price barriers.

In Xucheng 2019 paper, We have made a brief investigation into the effectiveness of an underpinning learning approach within algorithmic trading, proposing a least temporal difference learning approach. In fact although the results of the trading system were not as profitable as we had hoped, we believe that there are still a lot of openings to be discovered with this approach. In the Unborn workshop we can extend the idea to stock request data, as we know, there are a lot of algorithmic trading approaches that use stock request data, so it would be natural to expand the frame to cover this area.

2.3 Data driven Innovation Volatility approach. (Liang 2020)

This paper presents a maximum instructional estimating function grounded robust sludge, and a robust multiple trading strategy grounded on DDIVF using DD- EWMA cast model for volatility. The driving idea, unlike the being work, is that the filtering algorithm is attained using the incompletely Bayes EF approach . Data- driven robust trading strategies have been estimated through some trials and it's shown that the proposed robust trading strategy using DDIVF outperforms (i.e., has a larger profit and much more robust to original values) the trading strategy using KFIVF. Also, the robustness of the proposed system and algorithms are further tested in the unpredictable request.

2.4 A Quantitative and Maths based Approach

Here, we calculate buy and sell signals on securities by processing fetched market data. Data is processed through various mathematical calculations to determine trade opportunities like statistical arbitrage, mean reversion and momentum . This approach also does not require abundant resources to execute and still it can be a very profitable approach. The only drawback to this approach is that these trades cannot be perform on ultra fast time frames. Thus this approach cannot be used by HFT firms.

2.5 Algorithmic Trading using Technical Indicators

The market's uncertainties and many economic variables have an impact on asset prices. The process of executing orders using pre-programmed automated trading instructions that take asset characteristics like price and volume into account is known as algorithmic trading. Black-box trading is another name for algorithmic trading. It takes more than news or quotes to trade on the financial markets. By properly analysing data, trading challenges might be lessened. Technical indicators take stock price and volume information into account. Combining these technical indicators enables the development of risk-aware trading strategies. In this work, trading techniques based on time series data analysis are proposed. These techniques were created for high-profit intraday trading. The biggest returns, up to 12%, are provided by the approach using the RSI and MACD technical indicators.

III. CONCLUSION

We have reviewed all the majorly adopted algorithmic trading approaches in the industry. Considering all the approaches available we are adopting the quantitative approach that is the most relevant for our system. This research proposes Quantitative methods use mathematical calculations to make measured trading decisions which lead to optimal alpha generation whilst managing risk properly.

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REFERENCES

[1]. Grover 2021, Author:-Aruquipa A. Grover
[2]. Aloud 2021, Author:-MONIRA ESSA ALOUD AND NORA ALKHAMEES
[3]. Liang 2020, Author:-You Liang, Aerambamoorthy Thavaneswaran, Md. Erfanul Hoque
[4]. Wang 2019, Author:-Wei Wang, Nanpeng Yu
[5]. Xucheng 2019, Author:-Li Xuxheng, Peng Zhihao