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Survey on Short term Stock price predictions using machine learning

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ABSTRACT – For people who trade in the stock market, understanding price movement is critical in order to take positions of either buying or selling. No matter what instrument a person trades on, whether it is equity, futures or options, all instruments move according to the price of the stock. In this paper we look at and compare various kinds of techniques to predict the short term movement of a stock using machine learning and deep learning.

Keywords—stock market , machine learning , price prediction , strategies.

I. INTRODUCTION

The stock market is one of the most attractive investing opportunities in the world today. With the use of leverage and correct financial instruments, one can make 5 to 10% returns in a day, as compared to a 6% in a fixed deposit in a year. However just as quickly as these returns can be made, they can also erode your capital quickly.

So it is very important to have a fixed direction of your trade depending on the position you take. With traditional trading, you enter a long position(buy) when you believe that the price will go up from the current market price. Similarly, you enter a short position(sell) when you believe that the price will go lower than the current market price.

Thus direction is very important when trading in the stock market. There are various ways one can predict the direction of the stocks in the stock market. One of the most popular ways this is done is with the use of technical indicators. Technical indicators are indicators that perform mathematical functions on the price and give an output of whether to buy or sell the stock.

Indicators are of two types, leading and lagging indicators. Leading indicators are indicators which attempt to predict the price movement before the actual movement has happened. Leading indicators are useful in helping us make early entries in the stock at the best price. However their drawback is that there are lots of false signals at times, as prices do not always follow a pattern. Lagging indicators are indicators which predict price movement after a portion of the move has happened. They are excellent indications that the price move is correct and are good for confirmations. Their drawback is that they don't give the best entries as the price movement has already partially happened. Normally a combination of leading and lagging indicators is used. Apart from indicators, there is another method of trading which solely looks at the price of the stock. It is called as price action trading. It works on the assumption that history tends to repeat itself, and if price has reacted from a particular zone in the past, it can react to that zone favorably again.

In the last few years, people have tried to incorporate these methods of trading into machine learning. The indicators are generally used in classification and regressive machine learning models as they are numerical values and can be easily quantified. The price action strategies generally fall under the neural networks and the time series machine learning models like ARIMA.

II. PROBLEM STATEMENT

There are various websites, which are implanted basic calculations and formulas for probability of profit for stocks and option index, which are valid but less accurate in real world .thus investors, are confuse for buying or selling stocks.

III. TECHNIQUE

Inputs as date, lots size, strike price ,stock will be taken from user probability of profit is predicted for user and Strategies will be provided to user according to probability of profit in stocks for their individual.

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IV. PROPOSED FRAME WORK

For more accuracy, we proposed a website which will predict probability of profit for stocks and options index. We will implement technical indicators and machine learning. outputs of both technical indicators and machine learning will be combine and one output will be generated for probability of profit and result will be given to user in form of graph .strategies are given to user according to graph (output).

V. LITERATURE. SURVEY

[1] The authors have used an artificial neural network for forecasting the price of the stocks. For each neuron they have provided a technical indicator as an input. Their research believes that the use of lagging indicators gives a better output on the closing prices. They also believe that the use of more indicators will give different results. They have used indicators like EMA, SMA, WMA, RSI and Williamson's R%. They have tested this data on the top 5 companies of the IBOVESPA which is the Brazilian Stock Index.

[2] The authors have used technical indicators in order to make predictions on the NASDAQ stocks. The predictions are made on a portfolio of stocks, rather than a single stock. They have used indicators like Moving Average, Moving Average Convergence Divergence (MACD), Stochastic RSI, Bollinger bands, Average True Range, etc and trained the machine learning model of Support Vector Machine(SVM).

[3] The authors have taken four of the main industries of the Tehran Stock Exchange, and have applied various machine learning models to them like SVM, LSTM, Logistic Regression, Recurrent Neural Network, etc and given them ten technical indicators (like RSI, MACD, EMA, etc) as inputs. Their findings are that RNN and LSTM outperform the others.

[4]The authors have taken the daily closing prices of the nifty 50 index and sensex and have given that as an input to ARIMA model for prediction and forecasting future closing prices of these indices. The data shows ony a low 5% deviation of the predicted and actual prices.

[5] The authors have used a hybrid model, combining the ARIMA machine learning model with SVM in order to improve the prediction of stocks. These have been tested on the top 10 companies in the NASDAQ index.

[6] according to the authors of this paper, classification and sorting is done with LSM(least mean square) and
LDA(linear discriminant analysis) and they examine NASDAQ book order.

[7] according to the authors of this paper, they worked on multi-order fuzzy time series in which they applied technical analysis like ROC(rate of change),MACD(moving average convergence/divergence) with these they made multi-variable fuzzy time series and addition with DAR(directional accuracy rate) for root mean square error and mean square error.

[8]according to the authors of this paper , they combine these ESM(exponential smoothing model) ARIMA(autoregressive integrated moving average model) and BPNN(back propagation neural network)and proposed hybrid model (PHM)formed with this all model weight are determined by Shenzhen integrated index (SII) and Dow jones industrial average (DJIA).

Author name	Advantage	Disadvantage
F. B. Oriani	Combining neural networks with indicators makes for a very powerful trading system	Use of too many lagging indicators mean that the entries are delayed.
A. P. Ratto	Use of lots of different indicators with an average success rate of 61.6%.	Works on a portfolio of stocks, as opposed to a single stock.
M. Nabipour	Use of variety of different machine learning models to find the best one.	Small dataset of stocks tested on
S. M. Idrees	Only 5% deviation from	Not used individual stocks

	predicted and actual results.	and have focused on indices which are less volatile.
Ping-Feng Pai	Higher accuracy obtained by hybridization	Optimal parameters for the hybridization still not found.
Adamantios Ntakarisa,∗ , Juho Kanniainena , Moncef Gabbouja , Alexandros Iosifidisb	They combine LSM and LDA with order book data from NASDAQ	They have used NASDAQ book order data set .
Furong Yea , Liming Zhang b , Defu Zhanga,∗ , Hamido Fujitac , Zhiguo Gong	Improved fuzzy time series and addition of DAR for rot mean square .	This approach was not worked with subset of optimal fuzzy and cannot work on other forecasting problems
Ju jie wang Shu po go	They proposed new hybrid model with equal weight to ARIMA, ESM,BPN with there model.	Accuracy was less than other models and results are obtain with less accuracy in hybrid model.

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VI. CONCLUSION

According to our proposed system we will provide user with higher accuracy in probability of profit for stocks and options index with strategies for their better growth in stocks.

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