Market Price Analysis Using Artificial Neural Network

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Abstract— Analysis of Market price is regarded as a challenging task of financial time series analysis. An accurate analysis of market price movement may yield profits for investors. Due to the complexity of market data, development of efficient models for analysing is very difficult. Market price changes are receiving the increasing attention of investors, especially those who have long-term aims. The present study intends to assess the predictability of prices on Indian market through the application of artificial neural network models. the effective factors in Indian market prices have been accurately predicted and modelled in the form of a new pattern consisting of all variables. Here, research paper represents various Machine Learning and Artificial Intelligence approaches for analysing the market. Further, Artificial Intelligence model, the classification will be done on the basis of Artificial Intelligence Browser Automation tool. These classification model achieves more accuracy in analysing the market and can be used in analysing the market for future research.

Keywords— Neural network; Analysing market prices; Stochastic oscillator, Fibonacci retracement.

I. INTRODUCTION

The market has a strong regularity, but it is difficult to predict due to a large number of factors. In the past few decades, many algorithms have been applied to stock market prediction, but it is difficult to have a definitive mode[1]. Financial market sectors are one of the most intriguing developments within recent memory. They have significantly affected numerous territories like business, instruction, occupations, innovation and in this manner on the economy. However, analysing stock market movements and price behaviours is extremely challenging because of the markets dynamic, nonlinear, nonstationary, nonparametric, loud, and turbulent nature[3].Market price analysis has been at focus for years since it can yield significant profits. Analysing the market is certifiably not a basic errand, principally as a result of the close to random-walk behavior of a Market time series. Fundamental and technical analysis were the first two methods used to forecast market prices.Market price analysis is the act of trying to decide the future estimation of a Stock, Commodity, Forex or other monetary instrument exchanged market. The successful analysis of a Market's future price will maximize investor's gains. The Market have been mostly preoccupied with forecasting volatilites. There has been few studies bringing models from other forecasting areas such as technology forecasting.

Recently with more computational capacities and the accessibility to deal with monstrous information bases, it is feasible to utilize more mind boggling AI models, for instance, significant learning models, which poses widespread execution in traditional Natural Language Processing (NLP) endeavours. The notable important learning models are: CNN, RNN, expressly the LSTM designing and Recurrent Convolutional Neural Network (RCNN) (RCNN). A couple of cases of significant learning models for money related time plan checking are showed up in. These journalists apply an important neural association model that uses as details events taken from financial reporting to guess the heading of expenditures of a lot of stocks and the S&P 500 record. The rule ascribes of the work depicted in are the event depiction system and the CNN which models the impact of these events on stock costs lead in present moment, emphasis term and long stretch. The first is the significance of the assumption horizon, the resulting one is the common effect of a news report and the third one is the depiction sort of the information. Concerning at first point, each day assumption (intraday) is the most used. The makers in show that the introduction of step by step conjecture is dominating than step by step and month to month assumption. Regardless of that, the informational collection used in this work doesn't have the granularity to allow intraday trading, so a regular methodology was used. The resulting guide suggests toward

the stretch of time that news or events sway the stock costs direct. If the purpose is an ordinary inference, it is appeared to use the news appropriated the day went before to the conjecture day. In either case, Ding et al. prove that even a mix of step by step activities and events from the latest month will acquaint vital details with consistently figure. At last, corresponding to the last point, past works for the most part utilize straightforward attributes, for example, packs of words, thing phrases and named substances. As of late, other portrayal strategies, for example, word-implanting and occasion installing are utilized. They recognize from past techniques in light of the fact that can address complex attributes of words or occasions with lower-dimensional thick vectors.

II. Related Paper Work

Yifeng Wang at al [1], In this paper, they have proposed the Long Short-Term Memory neural network model to have effective forecasting on the market, which accuracy can reach 60% - 65% or more. wavelet analysis method is included to denoise the market data. A lot of improvements are made to the gradient descent function of LSTM and BP models, and a new data input method and training method are proposed for the LSTM model.

Deep learning models for every day directional developments prediction of a stock value utilizing monetary news titles and technical indicators as input. Experiments has shown that Convolutional Neural Network (CNN)[2] can be better than Recurrent Neural Networks (RNN) on catching semantic from texts and RNN is better on catching the context information and modeling complex temporal characteristics for market forecasting. there are two models looked at in this paper: a Hybrid model formed by a CNN for the finacial related news and a Long Short-Term Memory (LSTM) for specialized indicator.

Utilization of machine learning methods and different calculations for market value analysis and anticipating is an area that shows extraordinary guarantee. In this paper [3], They initially give a brief survey of stock markets and taxonomy of stock market prediction methods. then center around a portion of the research achievements in stock analysis and forecast. they talk about specialized, major, short-and long haul approaches utilized for stock analysis.

Forecasting alludes to a methodology of anticipating what is probably going to happen later on by seeing what has happened before previously and what is happening at present.This paper tries to build an efficient ARIMA model [4] to predict the Indian stock market volatility. An ARIMA model is a dynamic uni-variate estimating strategy to extend the future estimations a time series.

In this Paper for foreseeing of share price using ANN, They have utilized two modules , one is instructional meeting and other is predicting price based on previously trained data. They have used Backpropagation algorithm for training session and Multilayer Feedforward network [5] as a network model for predicting price. In this paper, we present a technique which can foresee market value utilizing Backpropagation algorithm and Multilayer Feed forward network.

III. METHODOLOGY

Datasets:-

Yunnan Baiyao Dataset :- forecast target and apply 1400 days stock data for training and next 100 days data for testing.

Time Series Dataset:- NSE(National Stock Exchange) , BSE(Bombay Stock Exchange),NSE has listed about 2000 firms to its name, BSE has 5000 firms listed to its name.

ACI Pharmaceutical Company Dataset:
It incorporates just 2 sources of info, They Predict stock values for future 8 days of November 2010.

Machine learning algorithm used in literature survey:

Logistic Regression:- The logistic model is utilized to show the likelihood of a specific class or occasion existing, for example, pass/fail, win/lose, alive/dead or sound/wiped out..

SVM (Support Vector Machine):- A support vector machine (SVM) is a supervised machine learning method that is used for classification. SVM develops a hyperplane or set of hyperplanes in a high dimensional space, which can be utilized for characterization or different tasks like detection of outliers from data. A good classification is accomplished by the hyperplane that has the largest distance to the closest preparing information purpose of any class.

Decision Tree: Decision trees orchestrate data in a tree-like

structure, ordering the information into different branches. Each branch represents an alternative decision. Tree like model represent to the choices and their potential results and utility. It can be also combined with other algorithms.

PCA: Principal Component Analysis (PCA) is unsupervised machine learning algorithm. It is used to define the variance and co-variance structure of a set of variables. It is also use as dimensionality reduction method. PCA defines vector which best represent the data in much lower dimension. It is broadly utilized instrument for information exploratory examination in machine learning.

Deep Learning Algorithm Used in Literature Survey:

Long Short-Term Memory (LSTM):- It is an artificial recurrent neural network (RNN) architecture utilized in the field of deep learning. It not only process single data points (such as images), but also entire sequences of data (such as speech or video). LSTM unit is composed of a cell, an input gate, an output gate and a forget gate.

Convolutional Neural Network:- It is a class of deep neural networks, most commonly applied to analyzing visual imagery. They are utilized fundamentally for picture handling, Classification, division and furthermore for other auto related information.

Recurrent Neural Network:- They are a type of Neural Network where past advance are taken care of as contribution to the current advance**.** The fundamental and most significant component of RNN is Hidden state, which recalls some data about an arrangement.

IV.FIRST EXPERIMENTAL RESULTS

The first step in finding the most accurate model is testing. This means applying more algorithms to the dataset and observing and comparing their results. Stochastic Oscillator Fig 1 shows its results.

Fig 1 Shows Stochastic Oscillator

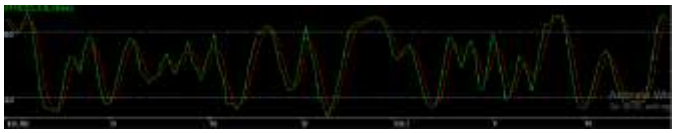

Fig 1.1 Show the Fast and slow

V. COMPARING RESULTS

After testing with the previous approaches, the dataset was modeled with Integrated Algorithm. The predicted results are starting to become close to the actual observations. This algorithm manages to indicate the current flow in the market. Fig. 2 shows the Integrated Algorithm approach to reach the correct values.

Fig 2 Shows the Integrated Algorithm

VI. CHOOSING THE BEST ALGORITHM

After observing different techniques or tools for market price analysis. I have observed that using one technique or tool it is not enough to capture the market movements appropriately.

Basically, in our Proposed methodology I have Integrated all 4 techniques which are Trend Line, Stochastic Oscillator, Super trend Indicator and Fibonacci Retracement Level for getting better accuracy than the Existing Algorithm. The main propaganda to integrate all techniques is to get an better result than Existing algorithms.

For Integrating the Techniques I have used Artificial Intelligence(AI) Browser Automation Tool which help in plotting all the algorithms on a single graph with better accuracy than existing work results.

In Existing work only single algorithm is applied on the chart or graph by which it gets an accuracy of only one algorithm but if integrate 4 algorithms we can get better results and definitely more accuracy than single algorithm.

CONCLUSIONS

As researchers and investors endeavour to out-perform the market, the utilization of neural networks to forecast stock market prices will be a continuing area of research. LSTM model function in the tensor flow library are not always optimal. Regression algorithm analysis Overfits. ARIMA model fails when there is unusual growth. Stochastic Oscilator has an better result accuracy rate. In conclusion we can say that if we train our framework with more informational index it create more blunder free forecast price.

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