

An Innovative Model For Stock Market Prediction Using Ann

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Abstract

An innovative Framework has been designed for stock market prediction using artificial neural network algorithm (ANN). The hidden layer deduction has been enhanced to find the exact baseline for the artificial neural network algorithm. K-means clustering algorithm has been used as a learning process due to its wide coverage and fast learning process. the efficiency and accuracy of the predicted stock have been validated by using the NSE stock exchange. The final result it was examined by ANOVA and regression test using SPSS.

Keywords: *K-Means, ANN (Artificial Neural Network), NSE, Stock Market.*

Introduction

Predicting the share market price is one of the major goals in the artificial intelligence field. The classical research in their fields primarily focuses on developing an approach to simulate human intelligence. The stock market data is generally non-linear and at the same time volatile also. The variation of the share price depends on many factors like the interest rate, securities equity prices, and so on. Up to date, there is not any method to predict the exact stock price of a market. For this reason, we need an effective method to predict the share price by integrating artificial intelligence with data mining and data engineering.

The stock market is one of the popular platforms for fresh Investments due to its huge profits. In share market existing predicting methods are either based on fundamental or technical analysis. The fundamental analysis is based on the analysis of assets and the economic value of the particular stock. Technical analysis is based on a broad calculation which delivers high accuracy when compared with the fundamental. it is clear that no one can perform a technical or fundamental analysis of stock during the trading session for more than two or three shares.

The share market prediction is an interesting topic. The entire process of the prediction of share market is completely complicated due to its uncertainty and non-linearity. To develop system for share market prediction one of the most vital tasks is to filter the exact input variables. There is no any technique or combination to predict the price of shares. Sometime a technique will work for a stock index but it will not work for another stock index.

In this proposed framework a model was developed to predict the share price and to overcome the existing problems. This proposed method uses artificial neural network algorithm with hidden layers. And also, k means clustering was used to solve the pre-processing issues.

Literature Survey

Integrated Long-Term Stock Selection Models Based on Feature Selection and Machine Learning Algorithms for China Stock Market

The linear multi-feature stock selection method is used for stock market prediction widely[1]. But the stock market is complex and nonlinear so the linear model may be unacceptable or maybe assumption. The author has constructed a better model to predict the stock price based on different feature selection and nonlinear stock price. The feature selection process has been done by the machine learning algorithm metric approach and the results have been cross-validated by using the Chinese share market. by analyzing different methods the random forest algorithm has performed well when compared with others.

Augmented Textual Features-Based Stock Market Prediction

Due to the non-linearity nature of the stock market price, it is a very difficult task to predict. The recent trends in predicting the stock market prices by using public sentiment analysis[2]. But there was a very big debate in using it about the friendliness and usefulness of the approach to the strength in the stock market and sentiments. The idea of researches varies from rejecting the sentiments to confirm the clarity about the stock market. that has contributed a method for stock market prediction based on public sentiment analysis and he has also tested that status in different stock domains. This method also includes deep learning and how that has attained an accuracy of about 60 %.

A Prediction Approach for Stock Market Volatility Based on Time Series Data

The production of time series data is more important and also so widespread in various domains. Time series data can be defined as an order or a set of sequence patterns that are available at equal intervals. The stock market data can be referred to as a time series data which is more complex and nonlinear and fluctuate greatly e with respect to time and trade. The stock market forecasting is based on time. Each and every industry of the stock market will aim to maximize their profit. The stock market is highly sensitive [3]. the authorized build and model to predict the Indian stock market based on a statistical model to predict the future price of the stock.

DeepClue: Visual Interpretation of Text-Based Deep Stock Prediction

The recent development in the field of deep learning has enabled many trading algorithms to predict stock price movements. But in real-time, there is a big gap to deploy those algorithms. Professional industries use different types of long term investment rules which they can understand quite easily. But on the other hand, deep learning methods generate rules which can be easily interpreted. The author proposes a model called a deep clue[4]. This method is based on a deep neural network architecture that can be used to extract the predictive features of the stock market. The second step is based on intercept model and visualization design. By various analysis methods, the deep clue algorithm is efficient in predicting the stock market investment analysis.

Stock Volatility Prediction by Hybrid Neural Network

Stock price movement forecasting is the hottest research topic nowadays. This method help in reducing the risk involving investments in the stock market. But the trend of the stock market does not only depend on time but also so it depends on some related social factors also. The author has proposed a hybrid time series model based on neural networks. This algorithm extracts the headlines of the news and related to the stock market and it is based on a text mining approach [5]. The result of this method is an increase of 5 percentage accuracy on average.

Proposed Framework

The proposed framework consists of several stages. The first stage is the input selection. The next stages of pre-processing of selected input data. The third stage is an artificial neural network algorithm. In the stage, the data get trained to reduce the error rate of the predicted results.

Input Data

The data set used in this step is stock market information on a daily basis. The attributes are open price, close price, high price, low price, and volume of trade.

Pre-processing.

In the stage, the input data set is cleaned by using k means clustering algorithm.which will eradicate the outliers present in the dataset. and cluster the data based on its feature.

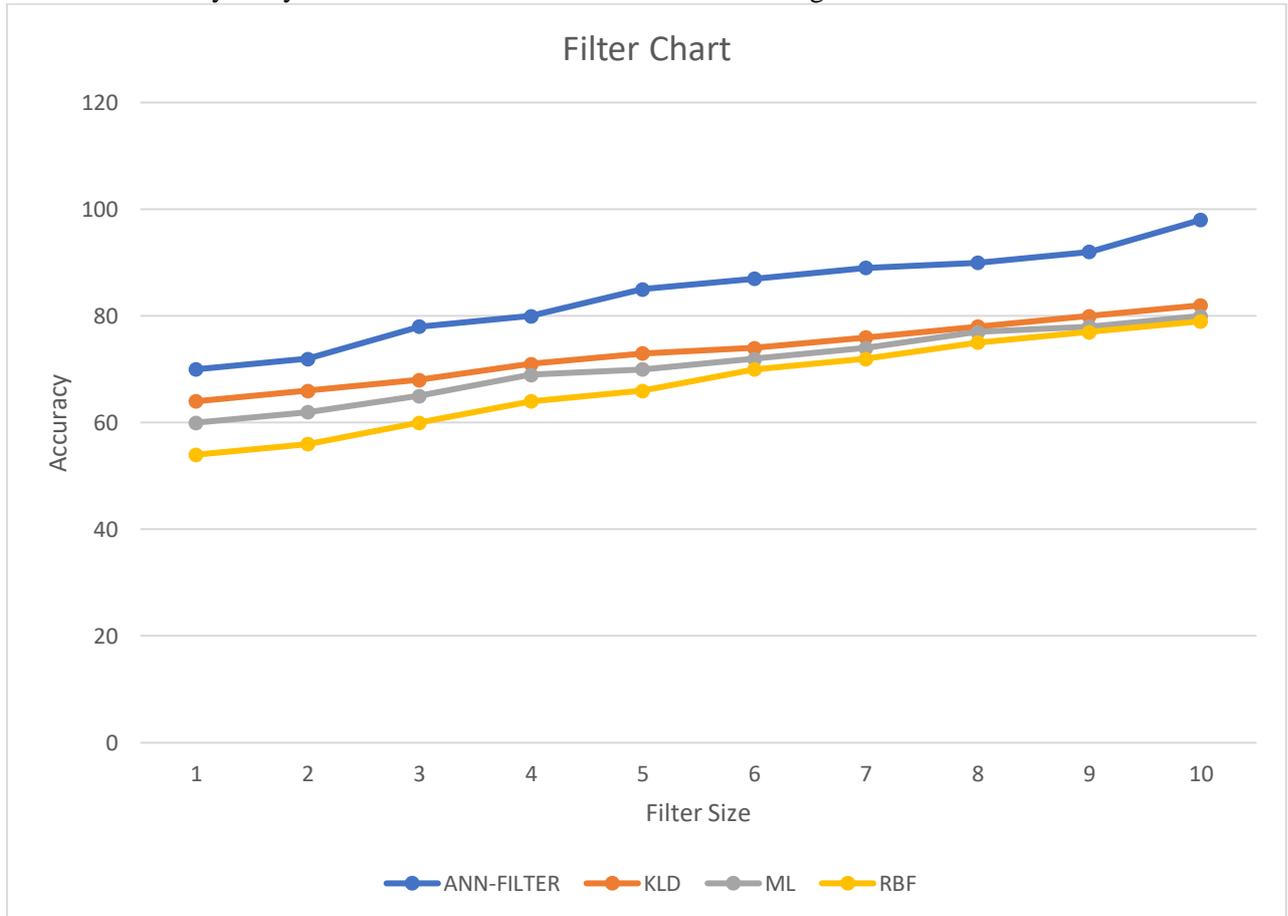
Neural networks.

In this step, the artificial neural network algorithm is deployed to extract the features from the data assigned to get trained. Features are learned in the training phase of the algorithm. Here multi hidden layers are generated the generated hidden layers are based on buy, sell, and hold.

Results and Discussion

Early researches focusing on artificial neural networks and its subordinates face a lot of challenges in stock market prediction. Lack of proper data and its error rate produces a weak point in training the neural network. A signal filter was introduced which ensures the strength of the data by

removing the noise present in it. The filter mainly focuses on three points which are “buy”, “sell”, and “hold”. Sensitivity analysis was conducted on the result achieved is great in nature.



Conclusion

This article presents in new model for stock market prediction based on artificial neural networks coupled with the k-means clustering algorithm. The learning process of the algorithm is efficient due to the hidden layer approach. And the hidden layer is also reinforced by setting a fixed point for “buy”, “sell”, and “hold”. The accuracy of this model was evaluated in national stock exchange. The predicted result it is close to the original data with a difference of 5 to 7 percentage.

Even though there are some limitations in this algorithm they are scalability and improving accuracy. Finally, the proposed Framework has performed well in various stages and the result which predicted is also closer to the original value.

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