

Optimized the Variation of Attribute for Stock Market Prediction Using Machine Learning

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Abstract

The wealth of currency and nation depends on the growth of the stock market. The prediction of stock price varies according to their parameters such as open price, close price and strike price. The variation of parameters creates an unstable and volatile situation for the stock market. The unstable nature of stock market diverts customers for the investments. In this paper proposed cascaded machine learning algorithm for the stock price prediction. The cascaded machine learning algorithm work with an optimized variance of stock parameters. The process of parameters optimization achieves by particle swarm optimization. The particle swarm optimization is a memory-based and iterative process. The proposed algorithm implemented in MATLAB software and tested with NSE data of different banks such as HDFC, IDBI and AXIS bank.

Keywords: Stock Market, Option Price, Machine Learning PSO, MATLAB, NSE.

I. Introduction

The unpredictable behaviors of the stock market always focus on academia and research. Many researchers are disagreeing with term unpredictable for market behaviors. The behaviors of market estimate with mathematical model with past experience data. the time series algorithms also used for the prediction of option price in stock market[1, 2]. The procedure of predication carries on machine learning and neural network-based models. The randomness of stock price degraded the movement of customers in stock market. The data mining and neural network proposed various predication model for stock price[3, 4]. The proposed model of stock price enhances the capacity of stock price. The machine learning also derived various model of stock market based on regression and classification[5, 6]. The enhance capacity of machine learning converted into form of deep neural network or deep learning is capable of good results of stock market. The capacity of deep learning of attribute extraction and classification uplift the process of option price predication. On the study of machine learning algorithms has its own advantage and limitation. This limitation creates the bottleneck problem for the predication of price predication in stock market. Various authors proposed machine learning derived model such as ensemble-based classifier and prototype classifier, these classifiers enhance the capacity of predication and enhance the stability of stock market. The selection of attribute is playing an important role in stock market predication[7, 8, 9]. The many attribute of stock price is gaussian nature and decrease the ratio of predication. For the minimization of attribute nature used data transformation methods and optimization algorithms. The various authors used the

process of genetic algorithm and many others swarm-based optimization algorithm for the selection of attribute on price prediction[10, 11]. This paper used particle swarm optimization algorithm for the optimization of attribute. The particle swarm optimization is dynamic memory based heuristic search. The PSO algorithm reduces the variance factor of attribute in terms of randomness and error of machine learning training algorithm. The cascading is technique to improve the capacity of machine learning algorithm. The process of cascading of machine learning algorithm just like of ensemble classifier, but in ensemble classifier used different classifier for the process of ensemble[12, 13, 14]. The cascading process of machine learning enhance two stage of machine learning algorithm such as (ML+1)[15]. The rest of paper organize in section II. Related work. in section III. Proposed algorithm of cascading model. In section IV. Describe the process of experimental result and finally discuss conclusion and future work in section V.

II. Related Work

The prediction of option price set the trends of market drives for the buyers. Various machine learning algorithms and models proposed by various authors for the set the accurate prediction of price in stock market. The work related to trends of price describe here.

Vijh, Mehar Et al. [1] Predicting securities exchange returns is a difficult errand because of reliably changing stock qualities which are subject to different boundaries which structure complex examples. The authentic dataset accessible on organization site comprises of just couple of highlights like high, low, open, close, nearby close estimation of stock costs, volume of offers exchanged and so forth, which are not adequate enough. To get higher precision in the anticipated value esteem new factors have been made utilizing the current factors. ANN is utilized for foreseeing the following day shutting cost of the stock and for a near investigation, RF is additionally executed. The near examination dependent on RMSE, MAPE and MBE values unmistakably demonstrate that ANN gives better forecast of stock costs when contrasted with RF. de Pauli, Suellen Teixeira Zavadzki Et al. [2] Prediction of monetary time arrangement is an incredible test for factual models. By and large, the securities exchange times arrangement present high instability because of its affectability to monetary and political components. Besides, as of late, the Coronavirus pandemic has caused an exceptional change in the stock trade times arrangement. In this difficult con-text, a few computational strategies have been examined to improve the exhibition of foreseeing such occasions arrangement. The principle objective of this article is to think about the forecast execution of five neural organization structures in anticipating the six most exchanged supplies of the official Brazilian stock trade B3 from March 2019 to April 2020. Analysts prepared the models to foresee the end cost of the following day utilizing as data sources its own past qualities. Scientists analyzed the prescient execution of numerous straight relapses, Elman, Jordan, outspread premise work, and multilayer perceptron structures dependent on the foundation of the mean square mistake. Scientists prepared all models utilizing the preparation set while hyper-boundaries, for example, the quantity of info factors and shrouded layers were chosen utilizing the testing set. In addition, scientists utilized the managed normal of 100 bootstrap tests as their expectation. In this way, their methodology permits us to quantify the vulnerability partner with the anticipated qualities. The outcomes demonstrated that for all occasion's arrangement, thought

about all designs, aside from the spiral premise work, the organizations tuning give appropriate fit, sensible forecasts, and certainty spans.

Mesquita, Caio Mário Et al. [3] Researchers investigated genuine information of 11-time arrangement identified with Brazilian stocks, zeroing in on the measurable qualities of the arrangement and the utilization of a LSTM neural organization to group future qualities. Scientists examined the aftereffects of 5 diverse fluctuation proportion tests and their relationship with the neural organization arrangement execution. This work examined the utilization of measurable tests in the LSTM preparing set to feature beforehand those arrangement that have more transient reliance and, thusly, perhaps better conjecture results. The outcomes demonstrated that 5 out of 11 stocks dismissed the irregular walk speculation through the difference proportion tests and that these equivalent stocks got the best exhibitions regarding order and monetary return. Kompella, Subhadra Et al. [4] Stock value guaging is a mainstream and significant subject in monetary and scholastic examinations. Offer market is an unstable spot for anticipating since there are no huge guidelines to appraise or foresee the cost of an offer in the offer market. Numerous strategies like specialized investigation, essential examination, time arrangement investigation and measurable examination and so on are utilized to anticipate the cost in tie share market yet none of these techniques are demonstrated as a reliably satisfactory forecast device. Scientists executed a Random Forest way to deal with anticipate financial exchange costs. Arbitrary Forests are viably actualized in anticipating stock costs, returns, and stock demonstrating. Scientists plot the plan of the Random Forest with its remarkable highlights and adjustable boundaries. Specialists center around a specific gathering of boundaries with a generally critical effect on the offer cost of an organization. With the assistance of feeling examination, analysts found the extremity score of the new article and that helped in guaging precise outcome. Despite the fact that offer market can never be anticipated with hundred percent precision because of its ambiguous space, this work targets demonstrating the productivity of Random woodland at guaging the stock costs.

Pedrozo, D., F. Barajas Et al. [5] the turn of events and execution of a computational apparatus dependent on the Long Short-Term Memory strategy were appeared. The code was written in python, and comprise of an intermittent neural organization utilized in the field of profound learning. In the code, scientists execute artificial knowledge, which utilizes straight and calculated relapse to make a prescient examination dependent on recorded information of each unfamiliar trade and the stock costs, with the objective of foreseeing the following purpose of things to come cost. Cross-approval among direct and strategic relapse is additionally performed to see which of the two has the most noteworthy achievement rate, that is, the exactness of the technique is assessed utilizing two approval options. Likewise, scientists make a lattice of sets of different unfamiliar trades to distinguish which are the most associated or backwards, so the program can open its scope of activities (all the while with different unfamiliar trade), and with this, a more noteworthy number of tasks can be made per time set up (in the unfamiliar trade case it is from one moment to five minutes, activities system is called scalping). At long last, analysts present the outcomes got, in view of the conduct of unfamiliar trade and stock costs, utilizing a factual prescient to survey the exactness of said test measurable model taken in this examination. Ding, Guangyu Et al. [6] a multi-esteem related organization

model of LSTM-based profound repetitive neural organization (Associated Net) is examined to foresee various costs of a stock all the while. The model structure, the calculation system and the trial configuration are introduced. The possibility and precision of the Associated Net are checked by contrasting the model and LSTM network model and the LSTM profound intermittent neural organization model. Various informational collections were utilized to confirm the pertinence of Associated Net model. Analyses show that the normal precision of Associated Net model isn't just in a way that is better than that of the other two models. Besides, it can foresee different qualities all the while, and the normal exactness of each anticipated worth is over 95%. Despite the fact that the model accomplishes great impact, there are still a few perspectives can be improved. For instance, basic math mean calculation is utilized in the count of absolute misfortune in preparing stage, and the objective is to enhance the model by decreasing the all-out misfortune. This misfortune estimation technique doesn't take into tally the connection between each sub-misfortune, just as certain subtleties when the absolute misfortune is the base, for example, the extraordinary circumstance of each sub-misfortune and the wavering during the time spent misfortune decrease. Chen, Chunchun Et al. [7] In request to make financial speculation steadier and more profitable, convolutional neural organization (CNN) and profound learning innovation are utilized to evaluate financial venture, in order to acquire more hearty venture and returns. With the nonstop advancement of top to bottom learning innovation, individuals are applying it increasingly more generally. Profound learning is advanced based on neural organization. It contains more shrouded layers, shows all the more remarkable learning capacity, and can extract information at a more significant level, to acquire more precise information. CNN is a multi-layer network structure which mimics the activity component of organic vision framework. Its uncommon structure can acquire more valuable element portrayals from unique information and is powerful in removing information. Subsequently, in this examination, the two advances are consolidated to evaluate monetary venture. The outcomes show that the convolution neural organization and profound learning calculation can acquire generally exact speculation methodologies, in this way guaranteeing venture returns and diminishing venture chances.

Hegazy, Osman Et al. [8] Financial business sectors are intriguing in the event that you can anticipate them. Likewise, the dealers following up on monetary business sectors produce a huge measure of data to examinations the outcomes of contributing as per the current market patterns. Securities exchange forecast is the method to decide if stock worth will go up or down as it assumes a functioning part in the monetary benefit of country's financial status. The establishment factor for every speculator is to increase greatest benefits on their ventures. In the event that the organization's benefits go up, you own a portion of those benefits and in the event that they go down, you lose benefits with them. Specialists examined a system utilizing Long Short-Term Memory AI calculation and versatile stock specialized pointers for productive estimating by utilizing different boundaries got from the chronicled informational collection considered for a specific organization. This calculation deals with verifiable information recovered from Yahoo Finance. For expectation of offer value utilizing Long Short-Term Memory, there are two modules, one is instructional course and other is foreseeing cost dependent on recently prepared information. Mahendran, Anand Et al. [9] Stock trade is an open market for the trading of association outline. Offers will be considered as minor

elements of an organization. Such little elements can be purchased by various partners. By and large, the organization holds dominant part of the offers. In view of various elements the cost of such offers is fixed. Stock intermediaries might be utilized by certain organizations to purchase/sell the offers. The investors by and large offer guidance to organizations dependent on the general feeling. This involves the way that a ton of variables cause variety in costs of the stock, making accepted forecast dependent on insignificant set of elements frequently off base. In this work, analysts investigate a methodology utilizing AI strategies (specifically neural organizations). Securities exchange shutting costs of shifted stocks are anticipated utilizing various calculations on the ANN tool compartment in MATLAB and connection of anticipated and obtained esteem investigation is performed relating to a NARX network which is nonlinear and autoregressive, among other exactness measurements and execution rules to draw out the accuracy and dependability of the individual preparing capacity. Naik, Nagaraj Et al. [10] Predicting stock value developments is troublesome because of the theoretical idea of the securities exchange. Exact expectations of stock costs permit dealers to build their benefits. Stock costs respond while accepting new data. During the exchanging day, it is hard to comprehend the here and there developments motioned by stock costs. This place of business the issue of variances in stock costs. Analysts talked about the technique to distinguish stock development pattern in information, and this strategy considered the blend of candle information and specialized marker esteems. The result of this technique is given as contributions to a profound neural organization (DNN) to characterize a stock cost's all over developments. Analysts make forecasts of the stock cost's all over developments in the NSE. The first commitment of this work is the identification of a pattern in information by utilizing a blend of candle information and specialized markers. The current examination has not thought about these mixes. The second commitment of this work is utilizing DNN to order and precisely anticipate a stock cost's here and there developments. The talked about profound neural organization forecast model beats the ANN model. This work centers around intraday forecasts.

Cao, Jiasheng Et al. [11] The supplies of ventures recorded in the Shenzhen A-share market in Guangdong Province were chosen; through the exact examination on the financial information and exchanging list information of recorded organizations spoke to by these stocks, the fundamental list information of the financial status of recorded organizations to which the stock has a place was prepared with dimensionality decrease dependent on the PCA strategy, and the exhaustive score file information of the assessment file were gotten. The form inclination calculations, energy slope plummet calculation, and BP neural organization calculation advanced by Bayesian regularization calculation were embraced to anticipate the stock cost. By looking at the three forecast strategies, it was discovered that BP neural organization of Bayesian regularization calculation has the best expectation impact. On this premise, an extensive stock determination plot was built and verified, and it was discovered that speculation stock choice system had great adequacy, which depended on the complete assessment investigation of recorded undertakings' working conditions with head part examination, the exploration of stock value expectation with PCA and BP neural organization calculation, and the customary stock choice examination strategy. As of now, there are as yet numerous territories to be improved in this examination. For instance, the information data chose in the

observational examination isn't sufficiently thorough, and there are countless elements influencing stock cost in the securities exchange. Based on the current exploration, the accompanying issues can be additionally examined and talked about: the determination of fac-pinnacles and factors influencing the stock value fluctuation in the exact examination; research on unusual wonders of stock value fluctuation.

Guo, Junjie Et al. [12] Stocks possess a crucial situation in the monetary market. Throughout the long term, researchers have put forth unremitting attempts in anticipating the financial exchange. Since the more precise the expectation, the more individuals will benefit from the financial exchange. AI has accomplished brilliant outcomes in stock forecast. These days, with the ascent of profound learning, the stock expectation strategies utilized by individuals are starting to lean towards profound learning, and numerous outcomes have been accomplished. This work will utilize news instead of customary stock organized information for stock forecast, and scientists will utilize AI and profound learning techniques interestingly. Additionally, analysts utilize regular language preparing to handle the news. The objects of expectation are stock records (DJIA, S and P500) and individual stocks (IBM, JPM). Ache, Xiongwen Et al. [13] to build up a creative neural organization way to deal with accomplish better financial exchange forecasts. Information were gotten from the domesticated animals market for ongoing and disconnected investigation and aftereffects of representations and examination to exhibit Internet of Multimedia of Things for stock examination. To examine the impact of market attributes on stock costs, customary neural organization calculations may inaccurately foresee the securities exchange, since the underlying load of the irregular determination issue can be effectively inclined to off base expectations. In view of the improvement of word vector in profound learning, analysts show the idea of stock vector. The info is not, at this point a solitary list or single stock list, yet multi-stock high-dimensional recorded information. Specialists talked about the profound long momentary memory neural organization (LSTM) with implanted layer and the long transient memory neural organization with programmed encoder to anticipate the financial exchange. In these two models, specialists utilize the installed layer and the programmed encoder, individually, to vectorize the information, in an offer to conjecture the stock through long momentary memory neural organization. The exploratory outcomes show that the profound LSTM with inserted layer is better. In particular, the precision of two models is 57.2 and 56.9%, separately, for the Shanghai A-shares composite list.

Nabipour, Mojtaba Et al. [14] Stock market likewise called as value market is the collection of the dealers and purchasers. It is worried about the area where the portions of different public recorded organizations are exchanged. For anticipating the development of economy, financial exchange goes about as a list. Because of the nonlinear nature, the forecast of the financial exchange turns into a difficult task. Be that as it may, the utilization of different AI strategies has been turning into a ground-breaking hotspot for the expectation. Parray, Irfan Ramzan Et al. [15] The reason for this investigation was the forecast assignment of securities exchange development by AI and profound learning calculations. Four securities exchange gatherings, to be specific expanded financials, oil, non-metallic minerals and fundamental metals, from Tehran stock trade were picked, and the dataset depended on ten years of verifiable records

with ten specialized highlights. Likewise, nine AI models and two profound learning strategies (RNN and LSTM) were utilized as indicators. Scientists guessed two methodologies for input esteems to models, consistent information and double information, and specialists utilized three classification measurements for assessments. their trial works demonstrated that there was a significant improvement in the presentation of models when they utilize paired information rather than persistent one. For sure, profound learning calculations (RNN and LSTM) were their boss models in the two methodologies.

Chung, Hyejung Et al. [16] man-made reasoning innovations have gotten extensive consideration due to their down to earth applications in different fields. The critical factor in this flourishing is profound realizing which is roused by the data preparing in organic cerebrums. In this examination, scientists apply one of the agent profound learning strategies multi-channel convolutional neural organizations (CNNs) to anticipate the vacillation of the stock list. Besides, analysts advance the organization geography of CNN to improve the model presentation. CNN has numerous hyper-boundaries that should be changed for developing an ideal model that can gain proficiency with the information designs proficiently. Specifically, specialists center around the advancement of highlight extraction part of CNN, in light of the fact that this is the main piece of the computational method of CNN. This investigation examined a technique to deliberately streamline the boundaries for the CNN model by utilizing hereditary calculation (GA). To confirm the viability of their model, analysts contrast the forecast result and standard fake neural organizations (ANNs) and CNN models. The exploratory outcomes show that the GA-CNN beats the near models and exhibit the viability of the half breed approach of GA and CNN. Strader, Troy J. Et al. [17] Stock market speculation procedures are mind boggling and depend on an assessment of huge measures of information. Lately, AI procedures have progressively been inspected to survey whether they can improve market estimating when contrasted and conventional methodologies. The target for this investigation is to distinguish bearings for future AI financial exchange expectation research dependent on a survey of momentum writing. A deliberate writing survey strategy is utilized to distinguish significant companion audited diary articles from the previous twenty years and sort examines that have comparable strategies and settings. Four classes arise: fake neural organization considers, uphold vector machine examines, contemplates utilizing hereditary calculations joined with different procedures, and studies utilizing half and half or other man-made brainpower draws near. Studies in every classification are looked into to distinguish regular discoveries, one of a kind discoveries, constraints, and territories that need further examination. Carta, Salvatore Et al. [18] The securities exchange anticipating is one of the most testing use of AI, as its recorded information are normally loud and unsteady. The greater part of the effective methodologies act in an administered way, naming preparing information as being of positive or negative snapshots of the market. Notwithstanding, preparing AI classifiers in such a way may experience the ill effects of over-fitting, since the market conduct relies upon a few outside elements like different business sectors patterns, political occasions, and so on In this work, scientists target limiting such issues by examined a gathering of support learning approaches which don't utilize explanations to learn, but instead figure out how to augment a return work over the preparation stage. To accomplish this objective, specialists abuse a Q-learning specialist prepared a few times with a similar

preparing information and examine its gathering conduct in significant genuine financial exchanges. Trial results in intraday exchanging demonstrate preferable execution over the traditional Buy-and-Hold procedure, which actually acts well in their arrangements. Scientists likewise examine subjective and quantitative examinations of these outcomes.

III. Proposed Methodology

The proposed method of stock price prediction describes in two section. In section I describe the process of attribute optimization of NSE data. and in section II. Describe the process of cascaded classifier for the final prediction of stock price

The variation of attribute degraded the prediction of stock price. For the optimization of attribute variance applied particle swam optimization. The particle swarm optimization is iterative based optimization algorithms. In particle of swarm optimization two main derivates of data processing one is acceleration factor and other is constant factor c_1 and c_2 . The process of particle swarm optimization[19] mapped with NSE stock data and the derivation describe as

$$Pk \cdot \frac{FSk - FSb}{FSmax - FSmin} \dots \dots \dots (1)$$

Define the process of data movement (Velocity)

$$V_{k,d} = \beta \times V_{k,d} + c \times r1 \times (x_{best,d} - x_{k,d}) \dots \dots \dots (2)$$

The set of variance data is

$$D=1, 2, M, \dots \dots \dots (3)$$

Update the position of new data

$$x_{k,d} = x_{k,d} + V_{k,d} \dots \dots \dots (4)$$

Where FS are fitness constraints and P is value of data iteration of probability of each data point. B is the wight, c is acceleration constant r1 is random value between 0 to 1.

Process of algorithms

1. Initialization of particle of data mapped in terms of swarm
2. Define the random position of particle
3. Define random velocity of particle
4. Iteration process stated and move to new data set
5. Terminate the process of iteration
6. Final set of optimal attribute Final_s(d1,d2,.....,dn)
7. Repeat step 2 to 4

Cascading of machine learning is the process of design of accurate algorithms for the prediction of stock price. The process of cascading used three level of support vector machine. The three level of support vector machine define as C0, C1, Cn. The processing of data of NSE is

normalized and optimized with particle of swarm optimization. The processing of cascading of support vector machine describe here.

A dataset describes by a raw attribute vector of dimension ($f*1$) we define t level with $t \geq 3$ in each level one or more class predict the dataset and process the result of prediction in next level of class.

The chain of cascaded classifier defines as

$$cascaded\ classifier = (C_0) \nabla (C_1) \nabla (C_2) \quad t \geq 3 \dots \dots \dots (5)$$

Algorithm for cascaded machine learning

Begin

Set of vector $SV_1=(C_0, SVM)$

Set of Vector $SV_2=(C_1, SVM)$

Set of vector $SV_3=(C_2, SVM)$

M = level of model for derived class

$C=\{SV_1,SV_2,SV_3\}$

End

Where

1. C_0 is class of data space for the processing of vector
2. C_1 is training level of class for the process of learning factor
3. C_2 is final class of prediction of stock price

Process of cascade of ML

Proceed data(D, C_2, L)

Begin

M =mapped model of L from class

New $D=\Phi$

For each prediction $=(x, y) \in D'$ (D' is trained sample of data)

For $j= 1$ to final C

Prediction $=\{ x, C_2$ class of M : map of final_s}

newD =newD \cup (predication)

return prediction

end

IV. Experimental Analysis

DATASET DESCRIPTION

Discuss the process of result analysis of SVM, SVR and Proposed methods. The proposed model simulated in MATLAB 14.0. for the process of analysis used NSE Banking (HDFC, IDBI, AXIS) dataset. For the evaluation used standard parameters NMSE, RMSE, MAE and MI[17, 18].

We evaluate prediction performance using four measures: normalized mean squared error (NMSE), root mean squared error (RMSE), mean absolute error (MAE), and mutual information (MI).

A. NMSE (*Normalized Mean Squared Error*)

Given a set of target returns and their predicted values, $\{r_{t+1}^n, \hat{r}_{t+1}^n\}_{n=1}^N$, NMSE is defined as

$$NSME = \frac{1}{N} \frac{\sum_{n=1}^N (r_{t+1}^n - \hat{r}_{t+1}^n)^2}{var(r_{t+1}^n)}$$

where $var(\cdot)$ denotes variance. Recall that $var(r_{t+1}^n) = \min_c \frac{1}{n} (r_{t+1}^n - C)^2$; NMSE is a mean squared error (MSE) normalized by the least MSE obtained from a constant prediction.

B. RMSE (*Root Mean Squared Error*)

RMSE is the square root of MSE, defined as follows:

$$RMSE = \sqrt{\frac{1}{N} \sum_{n=1}^N (r_{t+1}^n - \hat{r}_{t+1}^n)^2}$$

C. MAE (*Mean Absolute Error*)

MAE is defined as follows:

$$MAE = \frac{1}{N} \sum_{n=1}^N |r_{t+1}^n - \hat{r}_{t+1}^n|$$

Note that inequality holds for the last two measures, $MAE \leq RMSE \leq \sqrt{N} MAE$; both error measures are known to be informative, e.g., while MAE gives the same weight to all error amounts, RMSE is more sensitive to outliers, and is more suitable for normal distributed error. For more interpretations, see Chai and Draxler, 2014.

D. MI (*Mutual Information*)

MI measures dependency between r_{t+1} and u_t , and is defined as follows:

$$MI(r_{t+1}; u_t) = \sum_{r_{t+1}, u_t} p(r_{t+1}, u_t) \log \frac{p(r_{t+1}, u_t)}{p(r_{t+1})P(u_t)} \approx \frac{1}{N} \sum_{n=1}^N \log \frac{p(r_{t+1}^n | u_t^n)}{p(r_{t+1}^n)}$$

$MI(r_{t+1}; u_t)$ is zero when the two variables are independent, and bounded to the information entropy, $H(r_{t+1}) = -\sum_{r_{t+1}} p(r_{t+1}) \log p(r_{t+1})$, when the two variables are fully dependent. From the assumption made earlier, we have $r_{t+1} | u_t \sim N(\hat{r}_{t+1}, \beta)$. With an additional assumption, $r_{t+1} \sim N(\mu, \sigma)$ estimate the parameters β, μ and σ from the sample and evaluate MI from (20).

RESULT ANALYSIS

Dataset	D1	D2	D3	D4	D5	D6	D7	D8	Parameter
SVM[2]	0.865	0.906	0.886	0.842	0.832	0.876	0.808	0.753	NMSE
SVR[2]	0.884	0.915	0.872	0.886	0.847	0.903	0.812	0.784	
Proposed	0.898	0.929	0.896	0.876	0.856	0.896	0.826	0.796	
SVM[2]	0.674	0.704	0.534	0.684	0.698	0.635	0.703	0.792	RMSE
SVR[2]	0.689	0.753	0.556	0.665	0.764	0.648	0.715	0.804	
PROPOSED	0.698	0.734	0.565	0.679	0.782	0.652	0.725	0.811	
SVM[2]	0.785	0.619	0.726	0.6674	0.7004	0.6147	0.656	0.652	MAE
SVR[2]	0.765	0.689	0.752	0.6975	0.7225	0.6532	0.679	0.701	
PROPOSED	0.801	0.628	0.741	0.7343	0.7501	0.6355	0.692	0.668	
SVM[2]	0.003	0.0056	0.0012	0.0065	0.0042	0.0052	0.004	0.005	MI
SVR[2]	0.002	0.0041	0.0011	0.0053	0.0036	0.004	0.004	0.002	
PROPOSED	0.002	0.0057	0.002	0.0058	0.0038	0.008	0.004	0.003	

Table 1: Comparative result analysis of NMSE, RMSE, MAE and MI with dataset D1, D2, D3, D4, D5, D6, D7, D8 using SVM, SVR and PROPOSED methods so we find out the resultant of proposed method is comparing good to remaining two SVM and SVR methods.

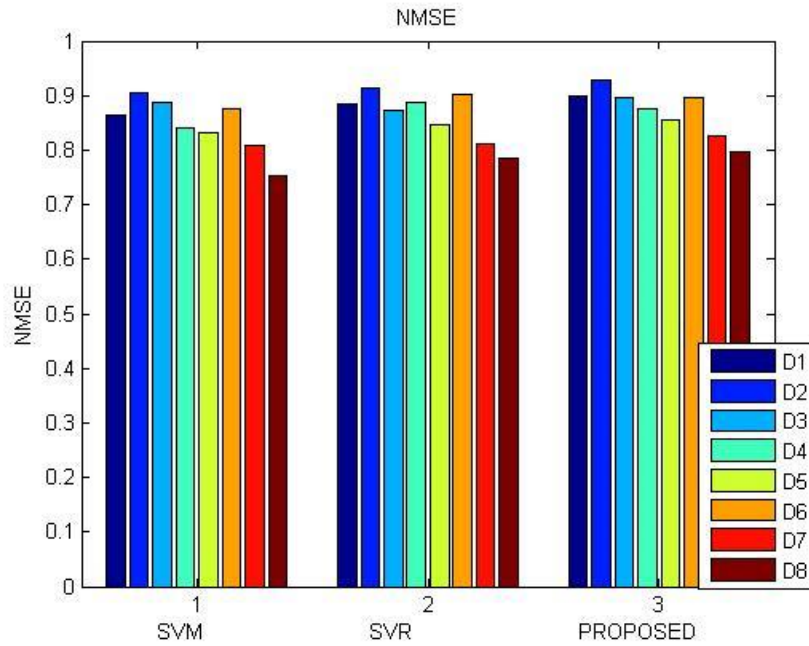


Figure 1: Comparative performance analysis of NMSE (Normalized Mean Square Error) using SVM[2], SVR[2] and PROPOSED methods here we observe the performance of Proposed method is compare good to remaining SVM and SVR methods with all datasets (D1. D2, D3, D4, D5, D6, D7, D8).

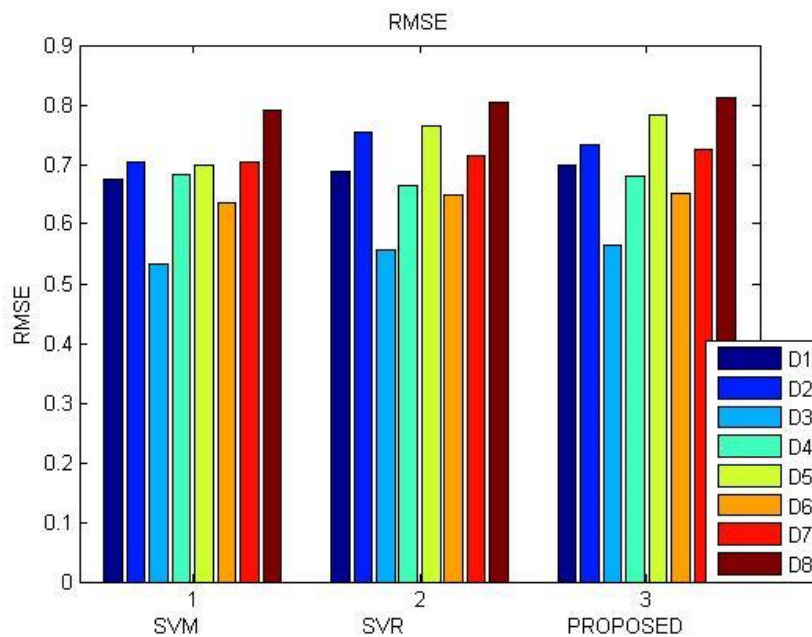


Figure 2: Comparative performance analysis of RMSE (Root Mean Square Error) using SVM[2], SVR[2] and PROPOSED methods here we observe the performance of Proposed method is compare good to remaining SVM and SVR methods with all datasets (D1. D2, D3, D4, D5, D6, D7, D8).

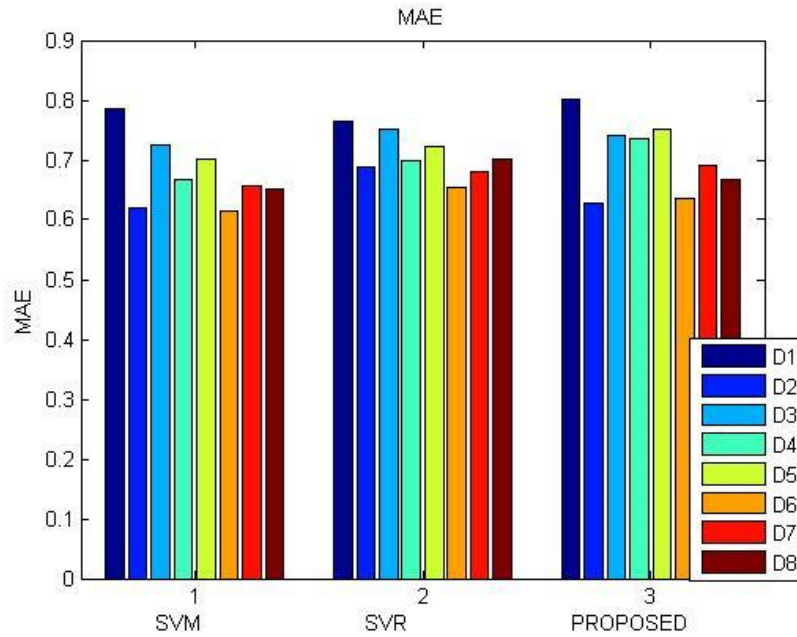


Figure 3: Comparative performance analysis of MEA (Mean Absolute Error) using SVM[2], SVR[2] and PROPOSED methods here we observe the performance of Proposed method is compare good to remaining SVM and SVR methods with all datasets (D1. D2, D3, D4, D5, D6, D7, D8).

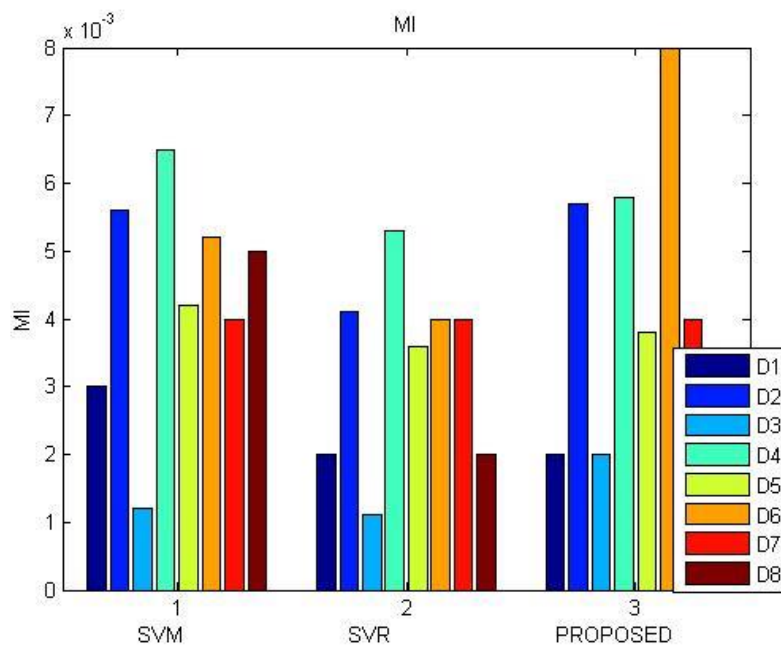


Figure 4: Comparative performance analysis of MI (Mutual Information) using SVM[2], SVR[2] and PROPOSED methods here we observe the performance of Proposed method is compare good to remaining SVM and SVR methods with all datasets (D1. D2, D3, D4, D5, D6, D7, D8).

V. Conclusion & Future Scope

The stability of stock price prediction put the direction of growth of the stock market buyers. The process of attribute optimization reduces the variation factor of the stock price. The optimization also describes data normalization and transformation of stock data. The proposed Cascaded classifier based on a machine learning algorithm improves the prediction ratio. The improve prediction ratio indicates that the number of iteration of data decreases and various parameters of error is minimized such as RMSE, MSE, etc., the increased value of MI gives the boost process of classification. The proposed algorithm compared with SVR and support vector machine. The SVR is a regressive function and supports vector machine is a statical classifier. The experimental value indicates the proposed cascaded classifier is better than SVR and SVM. the level of cascading increases the complexity of class level. In future applied different mechanism for classifier and reduced the complexity of classifier.

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