Impact Factor (SJIF): 5.301

International Journal of Advance Research in Engineering, Science & Technology

e-ISSN: 2393-9877, p-ISSN: 2394-2444

Volume 5, Issue 3, March-2018

Analyzing and Predicting Market Trends using SVM

Akhilesh Rane[1], Dheeraj Sukhnani[2], Meghana Arali[3], Priya Mishra[4], Prof. Ompriya Kale[5]

[1,2,3,4,5]*Department of Computer Engineering, Pimpri Chinchwad College of Engineering & Research, Ravet*

Abstract: Support Vector Machine is a popular machine learning technique which can be used to forecast stock prices effectively. This study uses daily closing prices for different stocks to predict future stock patterns. The available stock patterns are used as input parameters to the SVM model. The model attempts to predict whether a stock price in the future will be higher or lower than it is presently. Our results suggest that SVM is a powerful predictive tool for predicting stocks in the commercial market.

INTRODUCTION

Predicting the future stock patterns by analyzing available market data is a topic of concern for both researchers and investors. Among those popular available methods that have been employed, Machine Learning techniques are very popular due to the ability of identifying stock trends from massive amounts of available data that captures the underlying stock price dynamics. In this project, we applied supervised learning methods to stock price trends forecasting. We implement a system based on Support Vector Machines (SVM) for efficient stock market prediction. A variety of indicators from the technical analysis field of study are used as input parameters. Correlation between stock prices of different companies can be used to forecast the price of a stock. The genetic algorithm is used to select the set of most informative input features from among all the technical indicators.

- **PROBLEM STATEMENT**

The problem statement here is to optimally and accurately predict the stock market trends based on available stock data using Support Vector Machine.

- **LITERATURE REVIEW**

  - Mehak Usmani, Syed Hasan Adil, Kamran Raza and Syed Saad Azhar Ali;"Stock Market Prediction Using Machine Learning Techniques".

  The author's objective of this research is to predict the market performance of Karachi Stock Exchange (KSE) on day closing using different machine learning techniques. The prediction model uses different attributes as an input and predicts market as Positive Negative. The attributes used in the model includes Oil rates, Gold Silver rates, Interest rate, Foreign Exchange (FEX) rate, NEWS and social media feed. The old statistical techniques including Simple Moving Average (SMA) and Autoregressive Integrated Moving Average (ARIMA) are also used as input. The machine learning techniques including Single Layer Perceptron (SLP), Multi-Layer Perceptron (MLP), Radial Basis Function (RBF) and Support Vector Machine (SVM).The results suggest that performance of KSE-100 index can be predicted with machine learning techniques.[1]

  - Paul D. Yoo, Maria H. Kim, Tony Jan,"Machine Learning Techniques and Use of Event Information for Stock Market Prediction: A Survey and Evaluation".

This paper surveys machine learning techniques for stock market prediction. The prediction of stock markets is regarded as a challenging task of financial time series prediction.Recent developments in stock market prediction models are presented in this paper and their advantages and disadvantages are discussed. In addition, various global events and their issues on predicting stock markets are also investigated. From this survey, it is found that incorporating event information with prediction model plays very vital role for accurate prediction. Hence, an accurate event weighting method and a stable automated event extraction system are required to provide better performance in financial time series prediction. The author plans to use Neural networks to provide greater accuracy for both weekly rising and declining stock market tendencies.[2]

- Rohit Choudhry, and Kumkum Garg,"A Hybrid Machine Learning System for Stock Market Forecasting".

The author proposes a hybrid Genetic Algorithm(GA0- Support Vector Machine(SVM) architecture for stock market prediction. A variety of indicators from the technical analysis field of study are used as input features. They also make use of the correlation between stock prices of different companies to forecast the price of a stock, making use of technical indicators of highly correlated stocks, not only the stock to be predicted. The genetic algorithm is used to select the set of most informative input features from among all the technical indicators. The results show that the hybrid GA-SVM system out-performs the stand alone SVM system.[3]

- Radu Iacomin,"Stock Market Prediction".

The author proposes that the prediction of a non-linear signal requires advanced algorithms of machine learning. He surveys various algorithms like ANN (artificial neural networks) with different feature selection. The results of his study show that the algorithm of classification SVM (Support Vector Machines) with the help of feature selection PCA (Principal component analysis) will have the success of making a profit in the stock market.[4]

- Yuqing Dai, Yuning Zhang, "Machine Learning in Stock Price Trend Forecasting".

The author states that even if their initial next-day predication has very low accuracy around 50%, for the long-term stock price trend, their models achieved a high accuracy (79%).Based on our prediction result, a trading strategy on the stock was built, which significantly outran the stock performance itself. They have used the SVM architecture for the next day and future models present in the paper.[5]

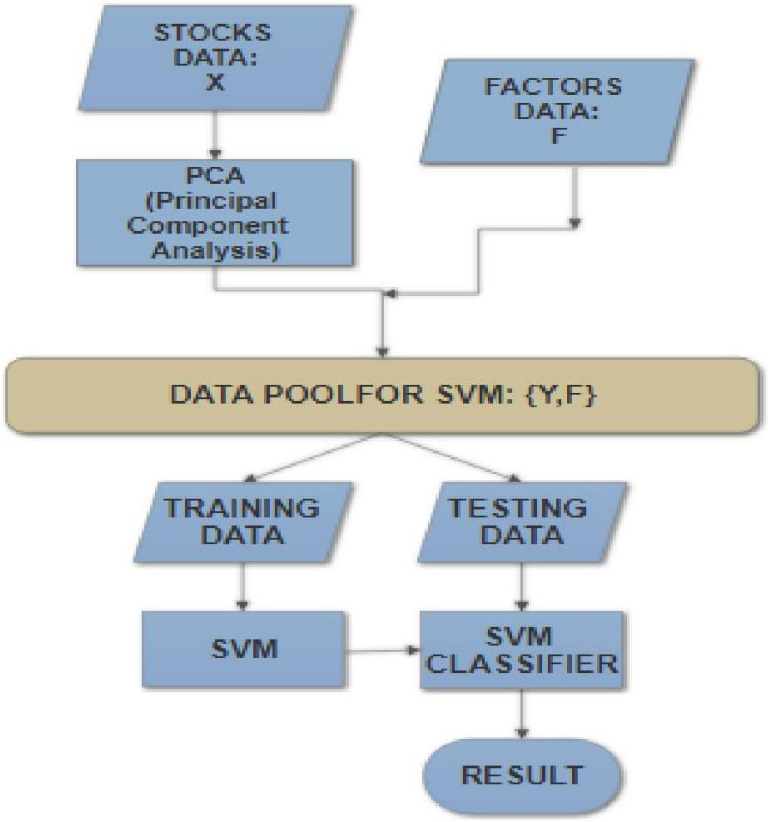
- Nikola Milosevic, "Equity forecast: Predicting long term stock price movement using machine learning"

The author predicts the stock market value for the Bloomberg index, using a very extensive data set. The author trained the models using C4.5 decision trees, Support Vector Machines with Sequential Minimal Optimization, JRip, Random Trees, Random Forest, Logistic regression, Nave Bayes and Bayesian Networks. In the beginning, he performed 10-fold cross validation on all thesealgorithms with all indicators and history price used as features. Then, manual feature selection was ascertained by removing features and evaluating whether performance of the algorithm improved or decreased. The process was performed iteratively, until he didn't get the optimal model with minimal number of features and the best performance.[6]

- Mr. Sachin Sampat Patil, Prof. Kailash Patidar, Assistant Prof. Megha Jain,"Stock Market Prediction Using Support Vector Machine"

The author implements the stock market prediction project using SVM and linear regression.The data that they use comes from Allegiant Travel Company(ALGT), Alliance Fiber Optic Products,(AFOP), AT T Inc. (T), Bank of New York Mellon Corpora(BK), eBay, Inc(EBAY),EXCO TECH(XTC.TO), Facebook, Inc(FB), FORD and many other data sets.[7]

- **SYSTEM ARCHITECTURE**



- **ARCHITECTURE DESCRIPTION**

1. Internal software data structure:
Stack, Queue

2.Temporary data structure:
Files created for interim use are described The ArrayList class extends Abstract List and implements the List interface. ArrayList supports dynamic arrays that can grow as needed. Standard Java arrays are of a fixed length. After arrays are created, they cannot grow or shrink, which means that you must know in advance how many elements an array will hold. Array lists are initially created with some arbitrary size. If the size exceeds, then the collection enlarges automatically and if the objects are removed from the array, the array shrinks accordingly.

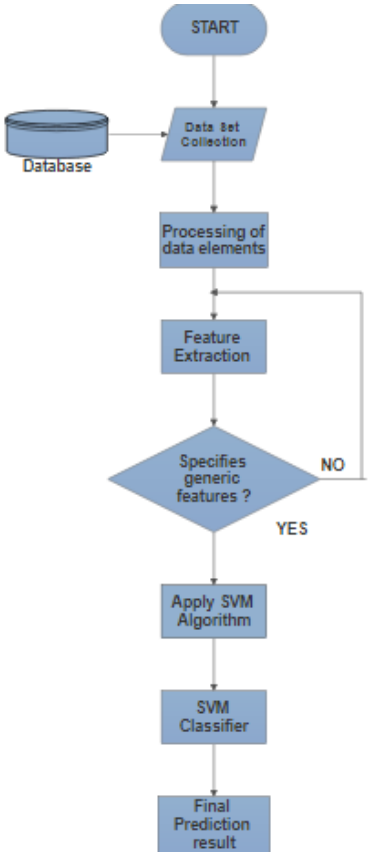
3.Database description:
MYSQL/ Mongo

- **MODULES**

The proposed system will have the following modules
• Data Collection
• Data Pre-Processing
• Data Processing
• Front-End (User Test)
• Prediction

- **FLOWCHART:**

The proposed flowchart for system is represented as:



- **CONCLUSION**

We have presented an approach towards predicting the stock market using Support Vector Machine. This model can be used by traders, agencies and companies to predict future stocks based on data collected from different global finanicial markets. Our conclusion can be summarized into following aspects: SVM algorithm works on the large dataset values that are collected from different global financial markets. Also SVM does not give a problem of over fitting.In addition to this SVM offers the ability to predict market directions more preciously than other existing techniques. Thus SVM has become very popular in stock market prediction due to its higher prediction accuracy.Higher profits are generated using the SVM model.

- **REFERENCES**

[1] Mehak Usmani, Syed Hasan Adil, Kamran Raza and Syed Saad Azhar Ali,"Stock Market Prediction Using Machine Learning Techniques",IEEE 3rd International Con-ference and Information Sciences (ICCOINS), Kuala Lumpur,Malaysia,2016.

[2] Paul D. Yoo, M. H. K.,"Machine Learning Techniques and Use of Event In-formation for Stock Market Prediction: A Survey and Evaluation",2015

[3] Rohit Choudhry, and Kumkum Garg,"A Hybrid Machine Learning System for Stock Market Forecasting",International Journal of Computer and International Engineering Vol:2,No.3,2008

[4] Radu Iacomin,"Stock Market Prediction",IEEE 19th International Conference on System

Theory,Control and Computing (ICSTCC),Cheile Gradistei,Romania,2015

[5] Yuqing Dai, Yuning Zhang,"Machine Learning in Stock Price Trend Forecasting",2010

[6] Nikola Milosevic,"Equity forecast: Predicting long term stock price movement using machine learning",2017

[7] Mr. Sachin Sampat Patil, Prof. Kailash Patidar, Assistant Prof. Megha Jain,"Stock Market Prediction Using Support Vector Machine",International Journal of Current Trends in Engineering Technology,2012