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Stock Market Prediction based on Social Sentiments using Machine Learning

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Abstract - *Machine learning and artificial intelligence techniques are being used to solve many real world problems. These techniques are highly effective, minimal effort and saving huge amount of time. Now people are invested in stock market or share market for yielding huge amount of money. Stock market is association of buyers and sellers. But in stock market, any time the stock value will grow or down according to the economic trends. So these changes could affect your share value and some times that decreases your profit. So stock market prediction is very necessary for avoiding this loss. We will propose a system that predicts the stock market value based on social sentiments using machine learning. We will collect the tweets from twitter API and Social media data to perform sentiment analysis and at same time collect data from Social media . Then find the correlation of historical data and extracted twitter data. This relational value used to determine the predicted outcome. This prediction system could greatly help stock investors in taking desired decision which could affect the profit of stock.*

Key Words: machine learning, sentiment analysis, twitter API, Social Media Data, stock market prediction.

1.INTRODUCTION

Stock Market Prediction System (SMPS)is a practical system that forecasts the stock price movement of various companies. Such a prediction could greatly help stock investor in taking desired decision which would directly contribute to his profits. Nowadays, social media has become a mirror that reflects people's thoughts and opinions to any particular event or news. Any positive or negative sentiment of public related to a particular company can have effect on its stock prices. Our system predicts the stock market prices of various companies by performing sentiment analysis of the social media data such as tweets related to the respective companies. We will collect the tweets from twitter API and Social media App and perform sentiment analysis of it. Corresponding to that time period, we shall analyze the stock values from past data and use a suitable machine learning algorithm to justify a valid correlation between the tweet sentiment and the stock values. Finally, with training data, we will train our model and develop capability to produce stock predictions for future. Since the public reaction to any event is available.

1.1 Aim

Our aim is to predict the risk of venous thromboembolism:

1. To filter the Social media data.

2. To enhance the classification on the basis of contents of the sentiments of the Social media data.

3. To improve the accuracy of the in predicting the stock price movement, in favour of the sentiments of the Social media data.

1.2 Motivation of the Project

- Machine learning and artificial intelligence techniques are being used in conjunction with data mining to solve a plethora of real world problems.

- These techniques have proven to be highly effective, yielding maximum accuracy with minimal monetary investment and also saving huge amounts of time.

- Such a prediction would greatly help a potential stock investor in taking informed decisions which would directly contribute to his profits.

1.3 Objectives

- To give knowledge to the user about the Stock Market.

- The proposed system will produce the efficient and accurate results that help stock investor in taking informed decisions.

- To classify that the sentiments of the Social media data.

- proved to be the most efficient and feasible model in predicting the stock price movement, in favour of the sentiments of the Social media data.

2. LITERATURE SURVEY

- **Paper 1: Improving Long Term Stock Market Prediction with Text Analysis.**

In this thesis, we looked at the problem of forecasting stock performance. Although a substantial volume of research exists on the topic, very little is aimed at long term forecasting while making use of machine learning methods and textual data sources. We prepared over ten years worth of stock data and proposed a solution which combines features from textual yearly and quarterly filings with fundamental factors for long term stock performance forecasting. Additionally, we developed a new method of extracting features from text for the purpose of performance forecasting and applied feature selection aided by a novel evaluation function.

Paper 2: Empirical analysis: stock market prediction via extreme learning machine.

In this paper, we present the design and architecture of our trading signal mining platform that employs extreme learning machine (ELM) to make stock price prediction based on those two data sources concurrently. Comprehensive experimental comparisons between ELM and the state-of the-art learning algorithms, including support vector machine (SVM) and back-propagation neural network (BPNN), have been undertaken on the intra-day tick-by-tick data of the H-share market and contemporaneous news archives.

Paper 3: Feeling The Stock Market: A Study in the Prediction of Financial Markets Based on News Sentiment.

This study proposed a sentiment analysis system developed to infer the polarity of news articles related to a company with the purpose of predicting the stock market.

3.ARCHITECTURE

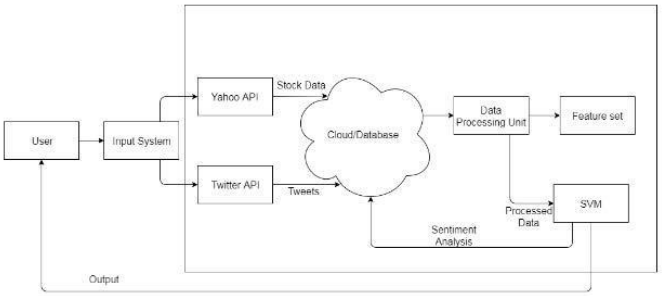
3.1 Problem Statement / Definition

Stock Market Prediction System (SMPS)is a practical system that forecasts the stock price movement of various companies. Such a prediction could greatly help stock investor in taking desired decision which would directly contribute to his profits. Nowadays, social media has become a mirror that reflects people's thoughts and opinions to any particular event or news. Any positive or negative sentiment of public related to a particular company can have effect on its stock prices. Our system predicts the stock market prices of various companies by performing sentiment analysis of the social media data such as tweets related to the respective companies. We will collect the tweets from twitter API Social media data and perform sentiment analysis of it. Corresponding to that time period, we shall analyze the stock values from past data and use a suitable machine learning algorithm to justify a valid correlation between the tweet sentiment and the stock values. Finally, with training data, we will train our model and develop capability to produce stock predictions for future. Since the public reaction to any event is available almost instantaneously on any social media, their mood can be captured quickly and an estimate of the volatility in stock prices can be determined.

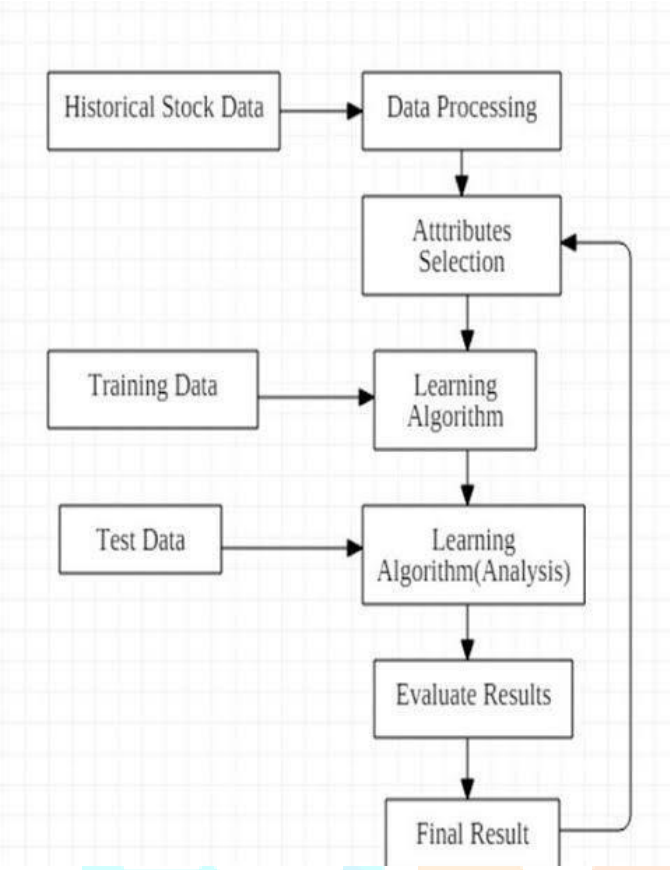
3.2 Proposed Architecture

1.This project is quite relevant as it guides people who possess limited know-how of investments and finance into making well informed decisions regarding stock market investments. It by passes the need for hiring investment experts who command exorbitant wages to guide our financial decisions by providing a simple solution which can be accessed by anyone having a computer or a laptop and an internet connection.

2.Stock market trends for a given time frame can be analysed easily even by the uninformed. Popularizing this machine learning option provides cheap alternative to various stock market investment guidance agencies which are in vogue today. The project puts in a small effort to assist the inexperienced investors and prevent from suffering heavy capital loss.



SYSTEM ARCHITECTURE



SYSTEM MODEL

3. CONCLUSIONS

Using Machine Learning technique and sentiment analysis for prediction purposes is inexpensive compared to other models. Support Vector Machine provide to be the most efficient and feasible model in predicting the stock price value. Cloud services will enable us to collect large amount of data and also store it in real time when we will get the data directly from the social media API. Collection of tweets and classification of tweets as positive, negative and neutral gives a good overview of public mood. The proposed system will produce the efficient and accurate results that help stock investor in taking informed decisions.

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