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Stock Market Price Prediction Using NLP with Sentimental Analysis

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ABSTRACT: Stock investment is a vehicle for many people to grow their wealth. However, market downturns can cause huge losses and need to be predicted for a timely sell. In fact, with effective prediction, stocks are a good investment even during periods of market volatility as many stocks are —on sale. News is an important source of signal for stock price movement. However, stock analysts usually adjust their analysis according to the news in a subject manner, and wrong judgments can cause investors huge losses. Twitter is a great source for breaking news, and provides a timely stream of signals on stock trends. News on Twitter also tends to have a great impact on the market due to the large number of Twitter users. This paper proposes a data-driven pipeline to timely incorporate Twitter news about a company into a time series prediction model on the company's stock price. Our approach, called BERT-LSTM (BELT), extracts informative features on stock price direction from Twitter news using the state-of-the-art natural language processing (NLP) model BERT, which are then used as covariates to a many-to-many stacked LSTM model that also utilizes historical stock prices to predict the direction of future stock price. Utilizing a carefully curated stock news dataset, we fine-tune BERT to effectively identify those news tweets that are relevant, and to extract NLP features that are indicative of price rises and falls. All model parameters are trained end-to-end to provide a data-driven and objective pipeline to incorporate news signals so as to avoid subjective analysis. Extensive experiments on real stock prices and Twitter news show that BELT is able to predict stock prices more accurately utilizing news information than if historical price data are used alone for prediction, and beats StockNet which is the current state of the art for news-based stock movement prediction.

KEYWORDS: Blockchain, KYC verification, Security, Privacy

I. INTRODUCTION

A. Overview

Stock market has a significant influence on both individual investor's interest and the country's entire economy trend. stock movement prediction plays an important role in reducing risk of loss and increasing gains. Stock prediction is always regarded as a challenging work. Due to the high volatility and uncertainty of complex market dynamics, internal and external information changes constantly and it is hard to make the best prediction. the security current price reflects all market information and if there is a new change in financial market, the stock price will adjust immediately. Two approaches that works on stock market forecasting: fundamental and technical analysis

B. Motivation

- We get motivate by the short comings of the current system.
- The goal of the system is to create something that can examine itself and make predictions based on News By Using NLP.
- The problem of stock price prediction is a well-known and essential one.
- With a successful stock forecasting model, we can gain knowledge about market behavior overtime, identifying trends that might otherwise go unnoticed don't he basis of News Data

II. RELATED WORK

Literature survey is the most important step in any kind of research. Before start developing we need to study the previous papers of our domain which we are working and on the basis of study we can predict or generate the drawback and start working with the reference of previous papers.

In this section, we briefly review the related work on Stock market prediction.

Due to its dynamics, non-linearity and complexity nature, stock market is inherently difficult to predict. One of the attractive objectives is to predict stock market movement direction by using public sentiments analysis. However, there is an active debate about the usefulness of this approach and the strength of causality between stock market trends and sentiments. The opinions of researchers range from rejecting the relationship to confirming a clear causality between sentiments and trading in stock markets. Nevertheless, many advanced computational methods have adopted sentiment-based features, yet did not attain maturity and performance. In this paper, we are contributing constructively in this debate by empirically investigating the predictability of stock market movement direction using an enhanced method of sentiments analysis. Precisely, we experiment on stock prices history, sentiments polarity, subjectivity, N-grams, customized text-based features in addition to features lags that are used for a finer-grained analysis. Five research questions have been investigated towards answering issues associated with stock market movement prediction using sentiment analysis. We have collected and studied the stocks of ten influential companies belonging to different stock domains in NASDAQ. Our analysis approach is complemented by a sophisticated causality analysis, an algorithmic feature selection and a variety of machine learning techniques including regularized models stacking[1].

In time series data analysis, stock market prediction is particularly hard. In addition, for the best estimation of stock prices, proper tuning of the model is crucial. This research work uses the frequently used algorithms Long Short Term Memory, Extreme Gradient Boosting (XGBoost), Linear Regression, Moving Average, and Last Value model on more than twelve months of historical stock data to build up a prediction model for forecasting stock price. For the purpose of comparing among the models, the measurement of Mean Absolute Percentage Error (MAPE) is used and it is observed that the LSTM method exceeds all the other methods with a MAPE of 0.635. Furthermore, the highest error rate among the five models is found for Moving Average for our case[2].

Price prediction in stock market is considered to be one of the most difficult tasks, because of the price dynamic. Previous study found that stock price volatility in a short term is closely related to the market sentiment; especially for small-cap stocks. This paper used the social media mining technology to quantitative evaluation market segment, and in combination with other factors to predict the stock price trend in short term. Experiment results show that by using social media mining combined with other information, the stock prices prediction model can forecast more accurate[3].

Stock market forecasting is very important in the planning of business activities. Stock price prediction has attracted many researchers in multiple disciplines including computer science, statistics, economics, finance, and operations research. Recent studies have shown that the vast amount of online information in the public domain such as Wikipedia usage pattern, news stories from the mainstream media, and social media discussions can have an observable effect on investors' opinions towards financial markets. The reliability of the computational models on stock market prediction is important as it is very sensitive to the economy and can directly lead to financial loss. In this paper, we retrieved, extracted, and analyzed the effects of news sentiments on the stock market. Our main contributions include the development of a sentiment analysis dictionary for the financial sector, the development of a dictionary-based sentiment analysis model, and the evaluation of the model for gauging the effects of news sentiments on stocks for the pharmaceutical market. Using only news sentiments, we achieved a directional accuracy of 70.59% trends in short-term stock price movement[4].

This paper proposes a novel, efficient, low complexity algorithm for edge detection, specifically focusing on the analysis of malaria infected microscopic thin blood smears. The algorithm proposes a simple, dynamic thresholding technique that is computed via histogram analysis, designed to capture as much information about the blood cells with minimal computational effort, which is followed by a morphological filtering process to remove noise and artifacts. A binary edge tracking system inspired by the works in fuzzy logic is introduced, defined by a semi ambiguous rule system that can be efficiently implemented in hardware[5].

III. PROPOSED SYSTEM

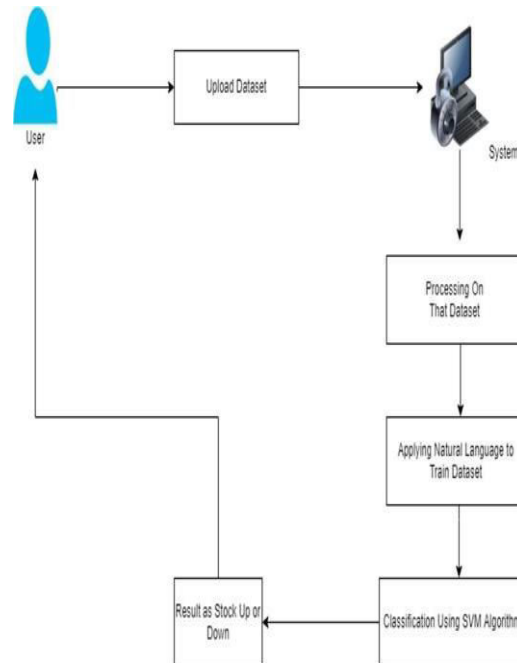


Fig. System Architecture

- Stock market prediction aims to determine the future movement of the stock value of a financial exchange.
- The accurate prediction of share price movement will lead to more profit investors can make.
- High in interpretability as the user can know which factor influences the price of stock more and by how much.

IV. CONCLUSION

In this project using augmented textual features as well as using finer-grained textual and sentiment analysis would provide better predictive ability to discover the stock market movement direction Based on News Headlines using Natural Language Processing . In the current work, we have proposed a methodology that starts by extracting multiple text-based features to enrich the representation of sentiments.

V. ACKNOWLEDGMENT

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