ML based stock prediction method for accurate future prediction of stock market

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Abstract---A CNN methodology can yield pretty accurate results on stock prices if we look at day-to-day fluctuation in stock prices, but where this method fails is in anticipating big changes in prices that are not based on trends. In technical analysis, price patterns are used to identify transitions between rising and falling trends. A price movement pattern that may be calculated using a series of trend lines and/or curves is known as a cost sequence. Finding patterns in high-dimensional data might be difficult since it is difficult to visualize. Many different machine learning algorithms can match this high-dimensional data to predict and classify future events, but having the computer learn the match for a specific area of the dataset might be expensive. Using deep learning, this study proposes a way for identifying various stock market pricing styles. A CNN is used to find the pattern in stock market data, and projections are made based on it. The stock pattern is divided into five pieces. Price stability, stock value fall (quick decline, moderate decline), and stock value increase (rapid increase, gradual increase). The accuracy of our system is 98.17 %.

Keywords---CNN, stock patterns, machine learning, stock prediction.

Introduction

Stock prices are extremely volatile, and this complexity attracts researchers and statisticians who want to figure out how to anticipate them. As a committed

investor into stocks of the German Stock Index (DAX) my interest in stock markets was already aroused many years ago. Based on a lack of deeper analytical knowledge, my investments into certain DAX stocks were mostly driven by intuition.
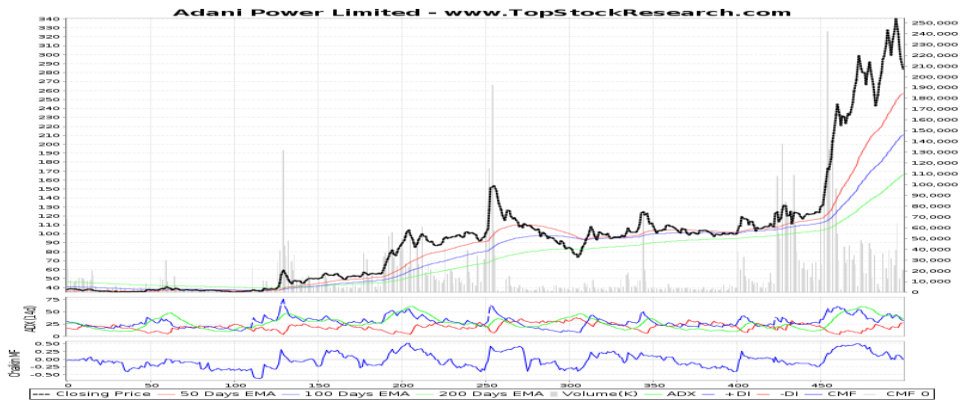

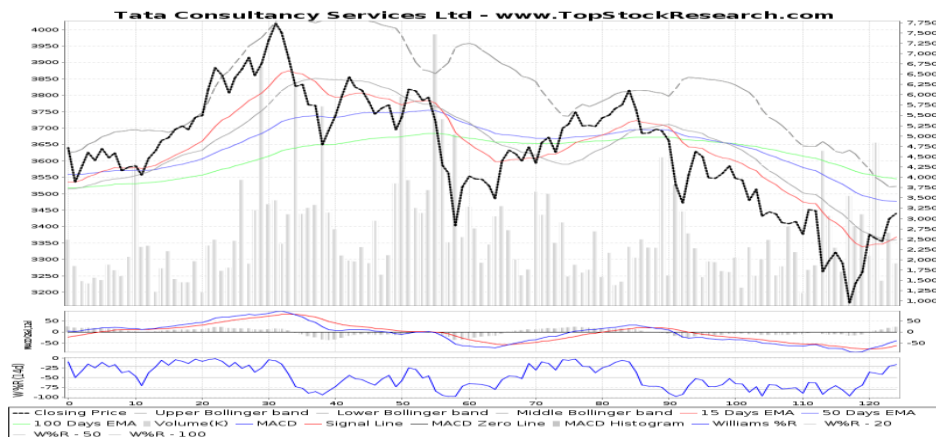Figure 1: Technical analysis chart of Adani Power

Figure 2: Technical analysis chart of TCS

I observed the development of return charts within a day and within the last couple of days, weeks and months. In addition to that, I read the latest news about the companies in my shortlist to get an orientation about their profitability and their possible performance potential. In fact, this approach shows some parallels to technical analysis when analyzing the charts itself and fundamental analysis when considering additional information regarding a certain company. Finally, I tried to buy when the return curve went down and sell on higher levels. At the beginning of my investor's career this plan worked out very well. Even though I became a successful intraday trader to this time, finally I ended up losing a lot of money on the German stock market. A main reason was not being a rational investor: I sold my entire portfolio in panic when the stock markets rapidly went down. In the end this seemed to be a good solution since the prices went down even more. But years later I regret my decision since my portfolio would have almost doubled until now. This was the moment when I felt the need

to understand more about useful approaches of investing into stock markets and maybe even compensate for the loss one day.

Figure 3: Stock market prediction

A major focus for my system was the correct timing of selling and buying stocks. I wanted to understand how professional investors use several approaches to increase profitability and reduce risk within their investments and develop an own method for making profitable investment decisions. In this system we use CNN algorithm for better accuracy.

Materials and Methods

Marc Velay and Fabrice Daniel (2018) "Stock Chart Pattern Recognition utilizing Deep Learning," as indicated by the review. It thought about the capacities of CNN and LSTM to perceive normal graph designs in chronicled stock information. The methodology used to create the preparation set, the brain network structures, and the correctness is accomplished are completely shown.

Victor Skuratov et.al (2019) The creators' work incorporates a "window" of fluctuating lengths that is parted down into outlines that scale on schedule to a solitary size and in sufficiency to one. For examination, the approaching casings are converted into 2D grids and took care of into a 2D convolutional NN, which assesses the probability of edges having a place with different example classes.

Rouf, N et.al (2021) Using progressed exchanging calculations and contemporary literary information from online entertainment organizations, specialists can gauge the market. Text information investigation and gathering calculations are instances of current AI advances that have impressively further developed expectation precision. In the interim, because of dynamic, conflicting, and turbulent information, financial exchange examination and forecast stays perhaps the most troublesome scholarly discipline.

Hyejung Chung and Kyung-shik Shin (2018) In their examination, the creators built a stock expense assumption model in light of RNN and LSTM units, which

is one of the most utilized significant learning processes. They utilized adjusted building bits of a model and consolidated GA and LSTM association to ponder the transient parts of the monetary exchange.

Kietikul Jearanaitanakij and Bundit Passaya (2019) The brain mind association and flame plans are utilized in this makers article to recommend a designing for determining the short example of stocks. The investigations are directed by an assortment of candle configuration pictures obtained from different stocks in Thailand's financial exchange (SET). Each picture catches six to twelve candles in its nearby area.

JINHO LEE1 et.al (2019) By and enormous, the portfolios developed considering the first model's outcomes yield generally 0.1 to 1.0 percent return each trade before to trade charges in 31 nations' stock trades. The discoveries propose that a couple of models in stock charts show similar stock expense patterns all through worldwide monetary trades. Moreover, the outcomes recommend that future stock costs might be anticipated freely of whether the model is made and tried utilizing information from numerous nations.

Ravikant1 Suman Kumar Swarnkar2L. P. Bhaiya (2018) This shows that, the makers proposed system is prepared for separating some bury association with in the data. Moreover, it is clear from the results that, SVR, RFR DTR model is good for perceiving the movements in designs. For the proposed strategy DTR is perceived as the best model. It uses the information given at a particular second for gauge.

Akshay M. More et.al (2018) The forecast utilizing AI calculations don't create solid outcomes as the relationship between's them is more fragile. Since the reliance for all factors is under half, the outcomes are not right. The diagram patterns among TCS and Infosys, then again, show tantamount unpredictability, except for a couple of times where they were in the other bearing. In such conditions, a mix of regular language handling procedures for text investigation and rundown may be valuable.

Rashmi Sutkatti1, Dr. D. A. Torse (2019) This creator's exploration examines an assortment of systems, including AI draws near, stowed away Markov models, ARIMA models, and profound learning processes. It very well may be seen that choosing the proper limits for the dataset utilized for assumption plays a significant part in forecast accuracy.

Xingyu Zhou et.al (2018) In this review, the creators present an overall system for antagonistic preparation to expect high-recurrence financial exchange utilizing Long Short-Term Memory (LSTM) and convolutional brain organizations (CNN). This approach utilizes a freely accessible file presented by exchanging programming as info, deterring the requirement for muddled monetary hypothesis study and thorough specialized investigation for the normal non-finance broker.

X. Li et.al (2022) The engineering of the module and the plan of SiC Schottky obstruction diodes to supplant standard Si quick recuperation diodes will be

examined top to bottom. The mechanical, warm, and electrical qualities of the mixture module are contrasted with those of its Si-based partner. In view of the testing results, electro-warm demonstrating is performed to assess the inverter framework level of the two modules.

Proposed System

The stock price of a particular commodity, as well as the stock value in previous years, is used as training inputs. From the provided data, statistical characteristics are retrieved and processed, then input to a classifier for comparison. As training data, it creates a stock chart. The system is fed current commodity stock values as input. Feature extraction is a dimensionality reduction technique that breaks down a vast amount of raw data into smaller chunks for processing. The vast number of variables in these massive data sets needs a significant amount of computer power to process.
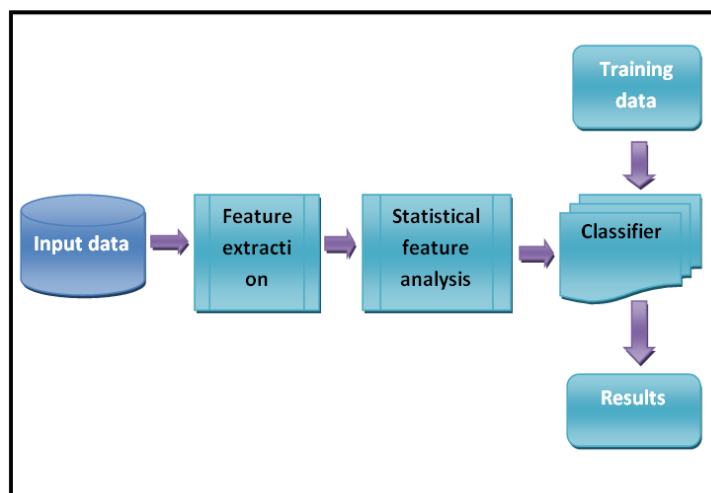
Figure 4: Architecture of proposed system

SET list: With the exception of equities that have been suspended for more than a year, the SET Index is a composite financial exchange list that is determined from the costs of every single basic stock on the principal leading body of the Stock Exchange.

Basic analysis: A strategy for deciding on speculating options is to do a fundamental analysis of stocks. Its primary relevance is in determining a security's intrinsic value. The current stock price may then be compared to see if the stock is overpriced or undervalued. Estimation of the index's closing value: The last price at which a stock trades during a standard trading session is referred to as "closing cost." Trading hours in several US markets are still 9:30 a.m. to 4:00 p.m. Moving normal hybrid inputs: The most basic type of hybrid is when the cost of an advantage goes from one side of a moving normal to the other and closes. Merchants use value hybrids to discriminate between moves in force, and they may also be used as an important passage or exit strategy.

Stock offer esteem: The cost of a single offer of multiple saleable loads of an organization, subordinate, or other money related resource is known as an offer cost. The stock cost, in layman's terms, is the most astounding sum that someone is prepared to pay for the stock, or the least amount for which it may be bought. The stock price of a particular commodity, as well as the stock value in prior years, is used as training inputs. From the provided data, statistical characteristics are retrieved and processed, then input to a classifier for comparison. As training data, it creates a stock chart. The system is fed current commodity stock values as input. Feature extraction is a dimensionality reduction procedure that reduces a large collection of raw data into smaller groupings for processing. The huge number of variables in these large data sets necessitates a lot of computational resources to process.

Methodology

CNN used for the stock chart pattern recognition to get the better accuracy of results as well as the it is time consuming process. To categories system stock into the following categories, a classifier (in this example, CNN) classifies characteristics from input data and compares them to statistical features from data.:

1. Abrupt decline: if stock values are abruptly decreasing over particular period of time in past years then system predicts that stocks prices will abruptly decline in future.
2. Smooth decline: system predicts that in near future prices of particular stock will decline smoothly (comparing pattern from last some years as specified in stock chart).
3. Stable: stock prices will be stable over the time period.
4. Smoothly increase: value of stock will smoothly increase.
5. Abruptly increase: if stock values are abruptly increasing over particular period of time in past years then system predicts that stocks prices will abruptly decline in future.

The objective of this discipline is to enable machines to see and understand the world in the same manner that humans do, and to utilise that knowledge for tasks like image and video recognition, image analysis and categorization, media reconstruction, recommendation systems, natural language processing, and so on. Advancements in Computer Vision using Deep Learning have been built and developed through time, mostly through the use of a single algorithm – the Convolutional Neural Network.
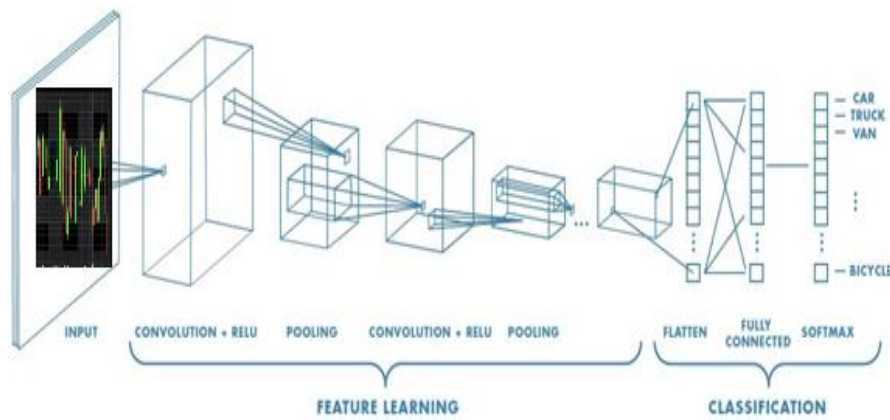
Figure 5: Architect CNN
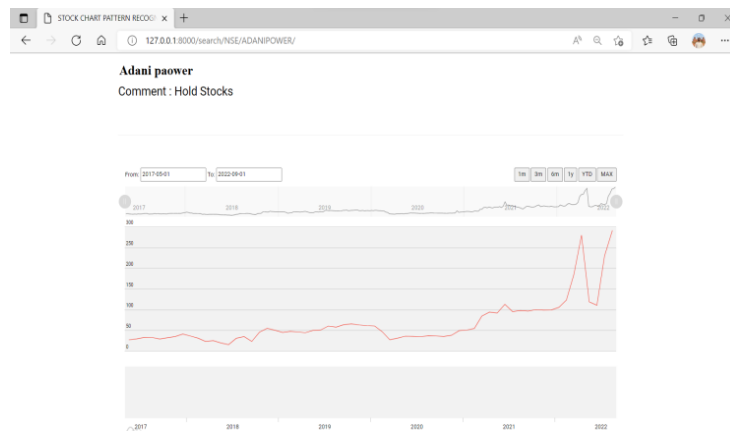
Results and Discussions

Figure 6: Results 1 Adani Paower

In the above figure we can see that the stock chart pattern recognize. We can see the above chart is the year between 2017 to 2022. Our system predicts the stock chart pattern in the comment that is hold stock. Pattern displays in above graph as well as it indicates the 1M means the pattern of past month, 3M means the pattern of past 3 month, 6M means the pattern of past 6 month, 1Y means the pattern of past year, YTD means the pattern of year to date and Max means all time stock chart patterns. This pattern is the hold stock because of the above graph is in one range.
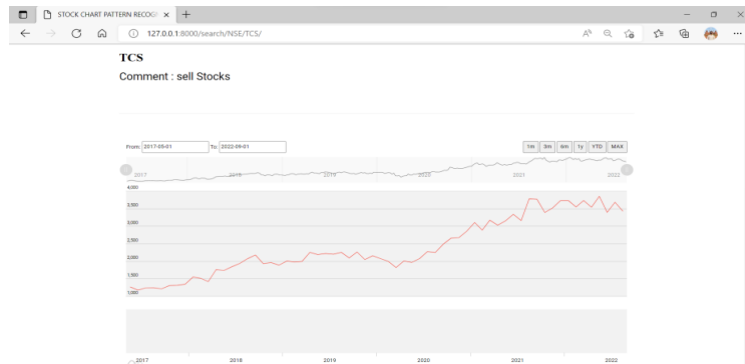
Figure 7: Results 2 TCS

In the above figure we can see that the stock chart pattern recognize. We can see the above chart is the year between 2017 to 2022. Our system predicts the stock chart pattern in the comment that is sell stock. Pattern displays in above graph as well as it indicates the 1M means the pattern of past month, 3M means the pattern of past 3 month, 6M means the pattern of past 6 month, 1Y means the pattern of past year, YTD means the pattern of year to date and Max means all time stock chart patterns. This pattern is the sell stock because of the above graph is increasing direction.
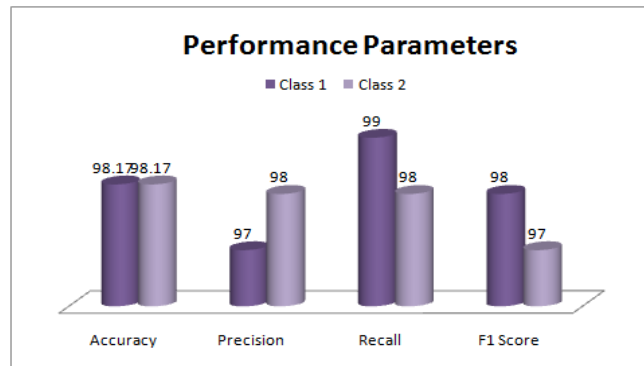

Figure 8: Performance Parameters

The diagram above depicts the confusion matrix for Class 1 and Class 2 training modules. While training the classifier as a train with the supplied input database, we achieved accuracy of 98.17 % and precision of 0.97 % in Class 1. The recall rate was dropped to 0.99 %, and the F1 score to 0.98 %. While training the classifier as a train using the given input database, we achieved accuracy of 98.17 % and precision of 0.98 % in Class 2. The recall rate has dropped to 0.98 %, while the F1 score has dropped to 0.97 %. After looking at the above performance criteria, we can conclude that our system's performance is superior with 98.17 %.
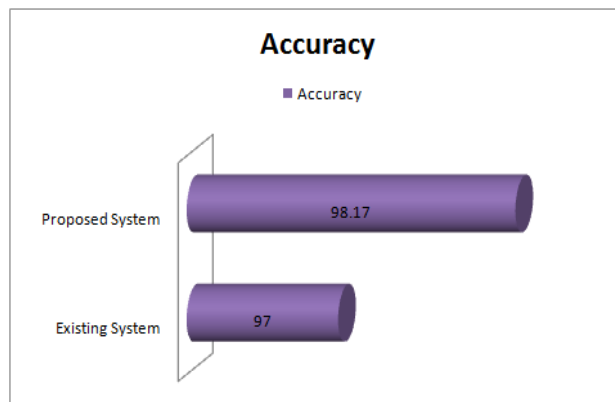
Figure 9: Accuracy comparison

The comparison of accuracy can be seen in that diagram. We compare our precision to that of the existing system. As can be seen, the old system provides 97 % accuracy, while our solution provides 98.17 %.

Conclusion

Speculators need to know the expected return on their investments, hence forecasting the securities exchange cost is well-known among financial professionals. Generally, stock costs were forecasted by qualified experts and intermediaries based on historical costs, volumes, value designs, and vital trends. Today, stock value expectations are more confusing than ever before, since stock costs are impacted by the organization's financial position, as well as the economic situation of the nation, political environment, and catastrophic occurrences, among other factors. Because the arrival from the offer market is inherently uncertain and ambiguous, traditional processes will not provide accurate expectations. Many budgetary exchanging frameworks have presented advanced perceptive procedures ranging from pure numerical models and master frameworks to neural systems for stock value anticipation, and a great deal of research has been done there. In this study, we will use CNN to predict stock prices and incentives for the following day. We can utilize improved pre-processing techniques to remove noise from data such that it has no effect on subsequent processes like classification and prediction. Our system gives 98.17% accuracy. We can conclude that our system gives better accuracy as soon as performance as compare to the existing system.

Acknowledgments

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