## (19) INDIA

(22) Date of filing of Application :10/10/2022

## (54) Title of the invention : INNOVATIVE APPROACH FOR PREDICTION OF STOCK PRICE AND MOVEMENTS USING FUZZY INFERENCE SYSTEM AND MACHINE LEARNING ALGORITHMS

## (57) Abstract :

In this work, a method of technical analysis and Fuzzy logic as a decision support system for investors in the stock market is proposed. The Fuzzy system used as input, information derived from technical analysis charts. The technical indicators chosen are Moving Average Convergence/Divergence (MACD), Relative Strength Index (RSI). Stochastic Oscillator (SO) and On-Balance Volume indicator (OBV). The inputs were created based on these indicators and experiments showed that the system performed satisfactorily in predicting future price movements in the stock market. The system mimics the behaviour of technical traders in interpreting technical indicators. By combining four different technical indicators as inputs, a more reliable system is built. The system involved mapping the technical indicators as inputs which are Fuzzified, creating membership functions to associate inputs and outputs via Fuzzy rules and translating the fuzzy output into crisp trading recommendation of buy, sell or hold. Experiments were done with MATLAB using actual stock data of two Nigerian banks and showed satisfactory results. When the calculated recommendations were combined with other information and investing skills of an individual investor, the decision support system will be very valuable. Also we extended our study to Machine learning. Traditionally the technical analysts and brokers used to predict the stock prices based on historical prices, volumes, price patterns and the basic trends. Today the stock price prediction has become very complex than before as stock prices are not only affected due to company's financial status but also due to socio economical condition of the country, political atmosphere and natural disasters etc. The return from the share market is always uncertain and ambiguity in nature hence traditional techniques will not give accurate prediction. A lot research has been made in this area and advanced intelligent techniques ranging from pure mathematical models and expert systems 1 -10/2022 1 2=42 to machine learning algorithms have also been proposed by many financial trading systems for stock price prediction. We use Linear Regression algorithm, Lasso regression algorithm, Ridge regression, SVM algorithm to predict the future price of a stock. The algorithms are very popular and we investigate in predicting the stock prices very accurately. A comparison between the Fuzzy graph and Machine learning graph. As it clearly visible from the graph that, our prediction price is almost coincides with the actual stock price. This method of predicting the return on investment will help in a great way to financial institutions and stock brokers to predict the future price in such uncertain conditions.

No. of Pages : 10 No. of Claims : 4