

# A Survey of Stock Price Prediction of Netflix Using Machine Learning

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**Abstract:-** This design aims to predict the stock price of Netflix using machine knowledge ways. Specifically, we will use intermittent neural networks (RNNs), a type of artificial neural network able of processing sequences of data, to dissect literal data on Netflix's stock prices and other fiscal variables similar as earnings, profit, and request trends. By training our model on this data, we will essay to identify patterns and trends that can be used to make prognostications about unborn stock prices. Other ways similar as decision trees, support vector machines (SVMs), and arbitrary timbers may also be explored. Still, it's important to keep in mind that prognosticating stock prices with machine literacy isn't an exact wisdom, and multiple sources of information and expert advice should be considered before making any investment opinions. Stock price prediction is a challenging task due to the complex and dynamic nature of the stock market. However, machine learning techniques have shown promising results in predicting stock prices. In this study, we explore the use of machine learning algorithms to predict the stock price of Netflix. We use a dataset containing historical stock prices of Netflix and other relevant variables, such as the company's financial metrics, news sentiment, and social media activity. We preprocess the data by cleaning, transforming, and feature engineering to extract useful information for prediction.

**Keywords:-** Stock Prediction, NFLX, Machine Learning, Support Vector Machines (Svms).

## I. INTRODUCTION

Predicting stock prices is a challenging task that has long fascinated investors, analysts, and researchers. Machine learning is a powerful tool that can be used to make predictions based on historical data, market trends, and other relevant factors. Netflix is a popular streaming service that has seen significant growth over the past few years. Its stock price has also been volatile, making it an interesting candidate for stock price prediction using machine learning. To make predictions about the future price of Netflix stock, we can use a variety of machine learning techniques, such as regression, time-series analysis, and deep learning. These techniques can be used to analyze historical stock prices,

news articles, social media sentiment, and other factors that may affect the stock price. The accuracy of the predictions will depend on the quality and quantity of data used, as well as the complexity of the machine learning models employed. It's important to note that no model can accurately predict stock prices with 100% certainty, as there are always unforeseen events that can impact the market. Overall, machine learning can be a powerful tool for predicting stock prices, but it should always be used in conjunction with other forms of analysis and investment strategies. Netflix is one of the world's leading streaming entertainment services, offering a wide range of TV shows, movies, documentaries, and more. As a publicly traded company, its stock price can be subject to volatility and fluctuations based on various market and industry factors. Machine learning has emerged as a powerful tool for predicting stock prices, as it can analyze large amounts of data and learn complex patterns and relationships that may be difficult for humans to discern. By applying machine learning algorithms to historical stock price data, market trends, financial statements, news sentiment, and economic indicators, it may be possible to build predictive models that can forecast future Netflix stock prices. A machine learning-based system for predicting Netflix stock prices could have significant implications for investors and financial analysts, as it could help inform investment decisions and provide insights into market trends and conditions. However, it is important to note that stock price prediction is a complex and challenging task, and there is no guarantee that any machine learning-based system will be able to accurately predict future stock prices. Nonetheless, the use of machine learning algorithms in stock price prediction continues to be an area of active research and development, with the potential to revolutionize how investors and analysts approach the stock market.

## II. TECHNOLOGIES USED

Predicting the stock price of Netflix involves assaying colorful data points and exercising colorful technologies. Then are some of the technologies generally used in prognosticating stock prices

➤ *Machine Learning:*

Machine Learning Machine literacy is a technology that allows computers to learn from data and make prognostications. It's generally used in prognosticating stock prices, and Netflix stock price vaticination is no exception.

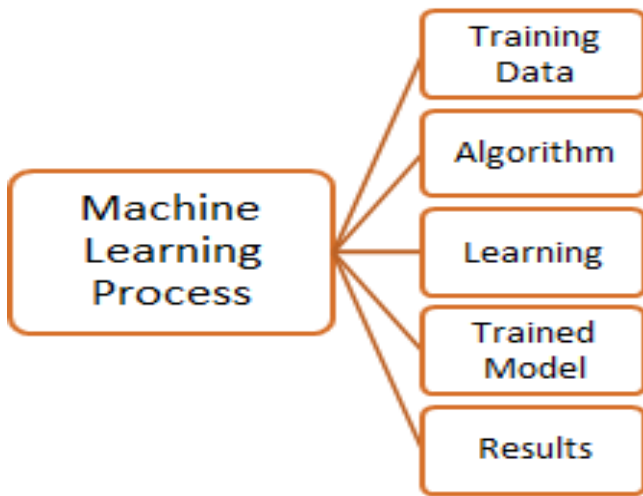


Fig 1 Machine Learning

➤ *Python:*

Python is a popular high-level programming language that is widely used in a variety of applications, including web development, scientific computing, data analysis, artificial intelligence, and more. It was first released in 1991 by Guido van Rossum and has since grown in popularity due to its simplicity, readability, and large community of developers.

**Dynamic typing:** Python is dynamically typed, meaning that data types are determined at runtime rather than compile time. This allows for greater flexibility and ease of use, but can also lead to errors if not used carefully.

**Object-oriented programming:** Python is an object-oriented language, which means that it supports encapsulation, inheritance, and polymorphism.

**Interpreted:** Python code is interpreted rather than compiled, which makes it easy to test and debug code, but can also result in slower execution times than compiled languages.

**Large standard library:** Python comes with a large standard library of modules and packages, which provide a wide range of functionality for tasks such as file I/O, networking, web development, and more.

**Cross-platform:** Python can run on a variety of operating systems, including Windows, Mac OS, and Linux.

➤ *K Nearest Neighbors Algorithm:*

The k-nearest neighbors regression algorithm (kNN regression) is a machine learning algorithm that can be used for prediction tasks. It works by finding the k closest data points in the training set to the input data point, and using their target values to predict the target value for the input.

• *Here's how the Algorithm Works:*

- ✓ Choose a value for k, which is the number of nearest neighbors to consider when making a prediction.
- ✓ Calculate the distance between the input data point and all the data points in the training set using a distance metric, such as Euclidean distance or Manhattan distance.
- ✓ Select the k data points with the shortest distances to the input data point.
- ✓ Calculate the average or weighted average of the target values for the k selected data points. This value is used as the predicted target value for the input data point.
- ✓ Repeat steps 2-4 for all input data points in the test set.

The kNN regression algorithm is a non-parametric algorithm, which means that it does not make any assumptions about the distribution of the data. It is also a lazy learning algorithm, which means that it does not have a training phase and simply stores the entire training set. One important consideration when using the kNN regression algorithm is the choice of distance metric and value of k. The distance metric can have a significant impact on the performance of the algorithm, and different metrics may be more appropriate for different types of data. The value of k also affects the performance of the algorithm, with larger values of k leading to smoother predictions but potentially sacrificing accuracy for small data sets. Overall, the kNN regression algorithm is a simple and effective machine learning algorithm for prediction tasks, with applications in a variety of fields such as finance, healthcare, and engineering.

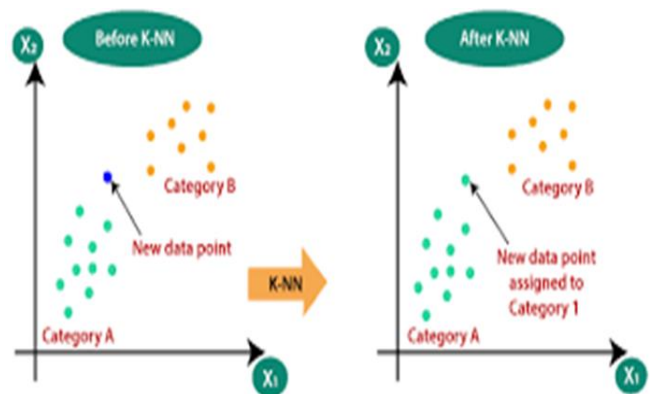


Fig 2 KNN Algorithm

**III. SOFTWARE REQUIREMENT SPECIFICATION**

➤ *Functional Specifications:*

Here are some functional specifications for a machine learning-based system for predicting Netflix stock prices:

• *Data Collection:*

The system should be able to collect and store historical stock price data for Netflix, as well as other relevant data such as market trends, news sentiment, economic indicators, and financial statements.

- **Data Preprocessing:**

The system should be able to preprocess the data to remove any missing values, outliers, or other anomalies that could affect the accuracy of the model.

- **Feature Selection and Engineering:**

The system should be able to select relevant features that are most likely to influence the stock prices, and engineer new features that can capture important relationships between different variables.

- **Model Training:**

The system should be able to train a machine learning model using the preprocessed data and selected features. Popular models for stock price prediction include linear regression, random forests, and deep neural networks.

- **Model Evaluation:**

The system should be able to evaluate the performance of the model using metrics such as mean absolute error (MAE), mean squared error (MSE), and root mean squared error (RMSE).

- **Hyper Parameter Tuning:**

The system should be able to optimize the model hyper parameters to improve its performance and generalization ability.

- **Prediction Generation:**

The system should be able to generate predictions for future Netflix stock prices based on the trained model and new data.

- **Deployment and Monitoring:**

The system should be able to deploy the model in a production environment and continuously monitor its performance to ensure that it's making accurate predictions and adapting to changing market conditions.

➤ **Non Functional Specifications:**

Here are some non-functional specifications for a machine learning-based system for predicting Netflix stock prices:

- **Accuracy:**

The system should be able to produce accurate predictions with a low error rate, to ensure that investors and analysts can make informed decisions based on the predictions.

- **Scalability:**

The system should be able to handle large amounts of data and continue to produce accurate predictions as the data set grows in size.

- **Reliability:**

The system should be reliable and available at all times, with minimal downtime or system failures that could impact the accuracy or timeliness of the predictions.

- **Interpretability:**

The system should be able to explain how it arrived at its predictions, providing transparency and insights into the factors and variables that influence Netflix stock prices.

- **Security:**

The system should be secure, with proper access controls, encryption, and other measures in place to protect sensitive data and prevent unauthorized access or data breaches.

- **Usability:**

The system should be user-friendly and easy to use, with a clear and intuitive interface that allows users to interact with the data and predictions.

- **Performance:**

The system should be able to produce predictions quickly, with low latency and minimal processing time, to ensure that users can make timely decisions based on the predictions.

- **Adaptability:**

The system should be able to adapt to changes in the market and new data sources, updating the model and predictions as necessary to ensure continued accuracy and relevance.

#### IV. EXISTING SYSTEM

Predicting stock prices is a complex task that requires a combination of technical analysis, fundamental analysis, and market sentiment analysis. Machine learning algorithms can be used to analyze past trends and patterns in the stock market data, and make predictions based on these patterns. However, it is important to note that stock prices are influenced by a wide range of factors, including market trends, economic indicators, company performance, and global events, among others, and machine learning models may not be able to capture all of these factors. There are many existing machine learning systems that can be used to predict stock prices, including regression models, neural networks, and support vector machines, among others. To use these systems to predict Netflix's stock price, you would need to collect historical stock price data for Netflix, as well as other relevant data such as market trends, economic indicators, and news articles related to the company. This data can then be fed into the machine learning model, which will use it to train and make predictions. It is important to note that stock price prediction using machine learning is not a perfect science, and the accuracy of predictions can vary depending on a range of factors. Therefore, it is important to use caution when making investment decisions based on these predictions, and to consult with a financial advisor before making any significant investment decisions.

➤ **Disadvantages:**

There are several disadvantages of using machine learning algorithms to predict Netflix's stock price:

- *Limited Predictive Accuracy:* The models can produce incorrect predictions due to unexpected events.
- *Data Quality:* The quality of the training data used to train the machine learning model is critical to its accuracy.
- *Overfitting:* The model becomes too complex and starts to fit the noise in the data instead of the underlying pattern. This can lead to poor generalization.
- *Interpretability:* Machine learning models can be difficult to interpret, especially when they are trained on large datasets.

**V. PROPOSED SYSTEM**

This section explains the six-step proposed methods to predict the stock trend based on profit for four years.

➤ *Data Collection*

The dataset used for this work was collected from Kaggle site for four years (from 5 Feb., 2018 to 4 Feb. 2022).The data consist of 1009 instances and 7 features: date, the highest price of the day, the lowest price of the day, open price, close price, volume and adjacentcloseprice.

➤ *Data Cleaning*

After data collection, data cleaning is done which dealt with missing data, duplicate data, and filtering out poor data. The downloaded data was not contained any missing or duplicate values so no need to clean the data. SRNO. Attribute Type Work

- DATE Numerical which contains all the dates between start date and end date.
- HIGH Numerical which describes the highest value the stock had in a previous year
- LOW Numerical is quite the contrary to high and resembles the lowest value the stock had in previous year
- OPEN Numerical is the value of the stock at the very beginning of the trading day
- CLOSE Numerical stands for the price at which the stock is valued before the trading day closes
- VOLUME Numerical tells you how many shares of that particular stock were traded that day
- ADJ.CLOSE Numerical Closing price adjusted for splits and dividend distributions

➤ *Data Selection*

At this stage, Data required for analysis was chosen and extracted from the dataset shows the kind and description of the seven (7) attributes in the Netflix stock dataset. Volume and Adj Close columns have been dropped with the help of drop command, so we are using only 5 columns: Date, High, and Low, Open and Close.

➤ *Data Transformation*

Data consolidation is another term for it. The chosen data is translated into forms that can be used for data mining at this stage. The datasets were scaled to fit the model's tolerances and saved in the Commas Separated Value (.CVS) file format. In this Dataset, record of each year is

kept separately and is analysed using python libraries. This is data transformation.

➤ *Data Mining Stage*

The data mining stage was divided into three phases. At each phase all the algorithms were used to analyse the stock datasets. The testing method adopted for this research was percentage split that train on a percentage of the dataset, cross validate on it and test on the remaining percentage.

➤ *Applying Machine Learning Algorithm*

In this project, K Neighbour's Regression machine learning algorithm is used. [Fig:5]

year	Date	Open	High	Low	Close	month	day	Profit
2020	2020-12-31	567.979980	575.369995	541.000000	556.549988	12	31	55.030029
2018	2018-12-31	421.380005	423.209991	413.079987	418.970001	12	31	32.529999
2021	2021-12-31	692.349976	700.989990	686.090027	691.690002	12	31	27.869996
2019	2019-12-31	382.769989	385.989990	378.799988	385.029999	12	31	17.639984

Fig 3 Applying Machine Learning Algorithm

➤ *Advantages:*

There are several advantages to using a machine learning-based system to predict Netflix stock prices:

- *Improved Accuracy:* Machine learning models can learn complex patterns.
- *Faster Processing:* Machine learning models can process large amounts of data quickly and efficiently.
- *Increased Automation:* Preprocessing to model training and deployment, reducing the need for manual intervention and saving time and resources.
- *Adaptability:* Machine learning models can adapt to changing market conditions.
- *Cost-Effectiveness:* A machine learning-based system can be more cost-effective than traditional stock price prediction methods.

**VI. SYSTEM ARCHITECTURE**

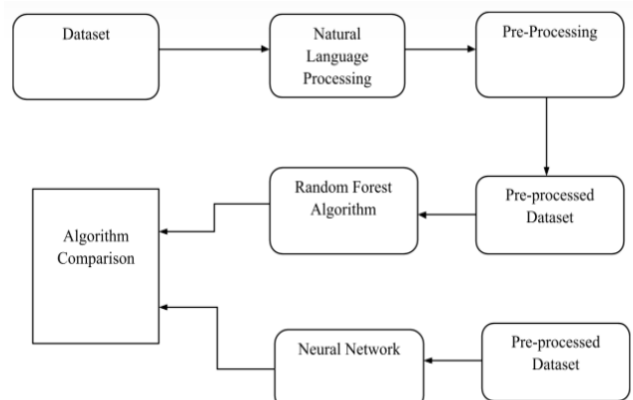


Fig 4 System Architecture

## VII. FUTURE SCOPE

In future, according to the cast, Netflix is prognosticated to increase over the coming times. The data vaticination cast that Netflix stock price is anticipated to rise to\$ 310 in 2023, \$ 514 in 2024, \$ 690 in 2025, \$ 867 in 2026, \$ 980 in 2027, \$,068 in 2028 and\$,166 in 2029. Netflix (NFLX) stock vaticination for 2030 is anticipated to reach\$, 217.

## VIII. CONCLUSION

By using decision tree model we predicted the stock price value which lead to the conclusion that it is possible to predict stock price with more accuracy and efficiency using machine learning technique. In the future the stock price prediction system can be further improved by utilizing a much bigger data set than one being utilized currently. This would help increase the accuracy of our prediction models. In this project, ML algorithms are used to predict the stock trend of NFLX by using technical indicators. The overall accuracy we obtained is fairly good enough i.e. 99% since the stock trend could be affected by many random factors other than news and price information. In this research paper, we end up with only one dataset of NFLX having a small number of instances (only from 2018 to 2021). In future projects, we extend our analysis on multiple datasets with many machine learning algorithms.

## REFERENCES

- [1]. Stock Price Prediction Using LSTM on Indian Share by Achyut Ghosh, Soumik Bose1, GiridharMaji, Narayan. Debnath, Soumya Sen
- [2]. Murtaza Roondiwala, Harshal Patel, Shraddha Varma, "Predicting Stock Prices Using LSTM" in Undergraduate Engineering Students, Department of Information Technology, Mumbai University, 2015.
- [3]. Xiongwen Pang, Yanqiang Zhou, Pan Wang, Weiwi Lin, "An innovative neural network approach for stock market prediction", 2018.
- [4]. Ishita Parmar, Navanshu Agarwal, Sheirsh Saxena, Ridam Arora, Shikhin Gupta, Himanshu Dhiman, Lokesh Chouhan Department of Computer Science and Engineering National Institute of Technology, Hamirpur – 177005, INDIA - Stock Market Prediction Using Machine Learning.
- [5]. Pranav Bhat Electronics and Telecommunication Department, Maharashtra Institute of Technology, Pune. Savitribai Phule Pune University - A Machine Learning Model for Stock Market Prediction.
- [6]. Anurag Sinha Department of computer science, Student, Amity University Jharkhand Ranchi, Jharkhand (India), 834001 - Stock Market Prediction Using Machine Learning.
- [7]. V.Kranthi Sai Reddy Student, ECM, Sreenidhi Institute of Science and Technology, Hyderabad, India - Stock Market Prediction Using Machine Learning.

- [8]. S. Tan, More People Trading and Investing During COVID-19 Pandemic, February 2021, Ashish Sharma, Dinesh Bhuriya, Upendra Singh. "Survey of Stock Market Prediction Using Machine Learning Approach", ICECA 2017.
- [9]. Loke. K.S. "Impact of Financial Ratios and Technical Analysis On Stock Price Prediction Using Random Forests", IEEE, 2017.

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