

# **Machine Learning approach in stock market price prediction: A case of Colombo Stock Exchange**

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## **Abstract**

Trading in the stock market has become one of the most popular and profitable investment decisions for investors. In stark contrast to the past, stock pricing today has become a more complex task. The profitability of the stock market investment depends on the investor's decisions and is based on a mix of dynamic environmental factors. The success of any investment decision is a reflection of efficient decision-making, historical data and financial statements analysis, knowledge on stock market and technical experience. Stock price trends are repeatedly forecasted to extract useful patterns and predict their movements. There are various approaches to stock price forecasting and as a replica of many scientific endeavors, several methods have been found to precisely predict stock prices. Most researchers have been applied machine learning techniques to get more accurate results. However, from Sri Lanka's perspective, there is no evidence on predicting stock prices using machine learning, specially the application of technical analysis. The main objective of this research is to examine the capability of predicting stock prices using machine learning techniques in the Sri Lankan context and fill the gaps in the literature. The population of the current study is all listed companies in the Colombo Stock Exchange. Among them, three listed companies which belong to capital goods, food, beverage & tobacco, and telecommunication services sectors were selected as the sample for this study by employing a mixed sampling method. Weka, a software developed by the University of Waikato, was used as the data mining tool to analyze the behavior of stock price fluctuation and each company were experimented with a thousand records which represent transactions over the past five years. The analysis was performed using five different classifiers and the results were evaluated using the mean absolute error, root mean error, relative absolute error, and root-relative square error. When models were evaluated using 10-fold cross-validation, Sequential Minimum Optimization regression has yielded more accurate results and all selected companies have presented accuracies higher than 85%. The findings of this study facilitate to predict the share price with higher accuracies and proposed model would benefit all individual investors in the local stock market.

**Keywords:** *Machine learning, sequential minimum optimization, stock price prediction.*