

Generative Adversarial Network for Sentiment-based Stock Prediction

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Abstract

In today's world, people are more involved in financial markets, due to technological progress like Artificial Intelligence (AI). There is no doubt that investors want to get the most out of this money market, which can be used to make more profit by predicting these markets. This profit can be achieved by predicting the market. Stock market prediction is one of the active topics in AI. Some studies use more features to predict the market, like analyzing people's opinions about the topic. They showed that using more information would create higher accuracy in the stock market prediction. Traders and investors always follow stock's news on social media which indicates that they do not only rely on the price index. In this research, we use two different social media datasets on two different languages, English and Persian. We propose two Generative Adversarial Network (GAN) models, the former one, named Price-GAN model, uses only optimized price features and the latter one, named Price-Sentiment-GAN uses sentiment feature model, along with optimized price features. The proposed GAN model includes Long Short-Term Memory (LSTM) as generator and Convolution Neural Networks (CNN) as discriminators. The proposed model predicts the close stock price for 15 English and 5 Persian stocks. The results show that both GAN models have a better performance than the baseline as well as other deep learning models. Moreover, Price-Sentiment-GAN archives the best accuracy, such that it improved the performance on English dataset by 1.65% and the performance of Persian dataset by 6.84%.

KEYWORDS:

Stock prediction, Sentiment analysis, GAN, Deep learning

1 | INTRODUCTION

From the past to the present, trade markets were noticed by people. Although the form of exchanges in these markets has changed over time, buying and selling at the right time are always interesting for people. Stock markets seem to play an essential role in the world's economic area, and the evolution and development of stock markets will continue. In today's world, the stock market and financial assets, such as stocks, bonds, and similar cases, are easily accessible; so that people can buy and sell even at home. With the ability of trading at home with even common devices, like smartphones, the number of traders increases every day. Stock market prediction has been an exciting and challenging topic over the past years. Investors and financial market analyzers always use their strategies to predict the future trend of stock markets. This will result in supply and demand in markets.