



Prediction of Stock Price Direction Using Machine Learning Models

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Abstract

Prediction of the stock trend is always a challenging but attractive topic. The goal of this article is to use emerging methods to predict the Chinese Shanghai Composite Index based on the performance of companies and investors. In this article, both widely used financial indicators, such as Moving Average Convergence Divergence and 10-day moving average, and the investors' sentiments are considered to predict the price movement of the Index. Investor sentiments are collected from the published reviews on a Chinese investor online forum, guba. The methods used are sector vector machine (SVM) and artificial neural network (ANN), and then they are combined with genetic algorithm (GA) to optimize their parameters. The results show that when considering financial indicator only, the accuracy of all models is above 85%, and when considering financial indicator and sentiment indicator together, the accuracy of all models is above 80% except the ANN-GA model (64.29%). Overall, the SVM-GA model shows the highest accuracy rate. However, considering investor sentiments could only remain the prediction performance at the same level, and even make it worse. It's also found that the sentiments extracted using different training data have relatively large differences, so the training data may be one potential reason for the poor performance of investor sentiments.

Keywords: prediction; section vector machine; artificial neural network; genetic algorithm; sentiment analysis.