

2

State-of-the-Art

In recent years, the problem of predicting stock market trends has been tackled through different techniques, from the classical statistical methods to the more complex tools of Machine Learning. Among these techniques, we could mention the use of ANN [2, 5, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21], PLSR [7], SVR [7, 28, 29], Support Vector Machines (SVM) [8, 9, 10] and Genetic Algorithms (GA) [8, 15, 30].

Since the middle 80's, ANN in particular have been widely used for this purpose. In the prediction of both indices, volumes and prices, this tool presents good results [2, 5, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 28, 29, 30].

Among the surveys about the subject, [1] analyzes more than 100 related published articles that focus on soft computing techniques applied to forecast stock markets. It classifies these techniques in terms of input data, forecasting methodology, performance evaluation and performance measures used. Through the surveyed papers, it is shown that soft computing techniques are widely accepted to studying and evaluating stock market behavior.

The main difference between previous work and ours is the predictors output. Most of the previous systems only predict stock trends or simply provide the users an action to be taken. In our modeling approach, we focus on predicting the minimum and maximum values achieved during the day to help the investor in the decision making process.

New stock market behaviour forecasting approaches have been proposed by simply varying the input features [2, 8, 15, 30, 31]. Here, like in [7], we explore not only interday features in the input data, but also the intraday features already known at prediction time. This online information helps to reduce the daily forecasting error [7].

In [2] and [5], the use of a trading system simulating an operational scenario as a better way to assess the forecasting process is also proposed. Nevertheless, they only explore one forecast within the same trading day and just buy and sell operations, besides ignoring some relevant stock market constraints, such as the stock exchange costs and income tax.

Hence, other than introducing three new prediction models, our novel contributions are the analysis of how a trading system can be employed to guide investors into Pairs Trading, as well as the evaluation of using intraday values as features for stock market predictors.