Various foreign exchange forecasting techniques have been examined by many researchers in the past five years, starting from the simplest forecasting techniques using a moving average method until the complex techniques intended to produce the most accurate forecast. One of the forecasting methods that is frequently studied for obtaining accurate results is concerned with the artificial neural networks based forecasting. The accuracy, which is also known as an error, is measured as the ratio between the actual and the forecasted data. In real life, however, the accuracy of buying and selling foreign currencies must also involve the profit that may be obtained. Therefore, developing methods of foreign exchange forecasting that combine the objectives to obtain both the minimum error and the maximum profit is becoming interesting idea to study.

In this research, the development of forecasting foreign currency exchange method as mentioned above is performed using a modified recurrent neural networks (RNN). In this context, the RNN that initially merely employs a single performance function for measuring the resulting error, is modified by adding a second performance function for measuring the profit that may be produced. These two performance functions are then optimized using the genetic algorithm to fulfil the desired objective for both minimizing the error of the RNN as well as for maximizing the profit that may be produced by the forecasting result.

The experiments of the method developed in this research are performed using a daily time series for a period ranging from January 4, 1999 until October 20, 2010, downloaded from a financial website http://www.tradingblox.com/free-historical-data.htm. Several scenario have been experimented using this data to forecast three types of foreign exchange currencies that are frequently used in the daily life; i.e., USD/JPY, EUR/USD, and GBP/USD. Experimental results show that the forecasting results that both minimizing the error and optimizing the profit can be achieved using a modified RNN employing a pair of performance functions that are optimized using the genetic algorithm.

Keywords: forecasting of foreign exchange currency, recurrent neural networks, genetic algorithm, minimum error, maximum profit