Abstract

Foreign exchange (forex) is now not only used as a means of payment transactions , but also can be used as an instrument of investment through the sale and purchase of foreign exchange . This business opportunity occurs because the value of the foreign exchange is always changing according to the offer (bid) and demand (ask) . In fact forex business is not easy , it needs a strong understanding and analysis to predict the direction of movement of the exchange rate in the future . The same is also done various companies that conduct transactions with foreign currency , the predictive value of currency is needed to minimize the negative impact of fluctuations in foreign exchange rates . For that developed various forecasting techniques to predict foreign exchange rates. In this final projest used Artificial Neural Networks (ANN) Feedforward algorithm as training and testing, and using Particle Swarm Optimization algorithm (PSO) to optimize the synaptic weights of ANN while training. PSO type used using additional inertia weight parameter . ANN - PSO algorithm is then used to process the data time series of exchange rate rupiah against U.S. dollar (USD / IDR) . Output of the ANN - PSO system in the form of foreign exchange predicted value , then its performance will be measured using the MAPE (Mean Absolute Error Presentage) and direction prediction accuracy. From the test results obtained a combination of optimal parameters , namely the number of neurons in tinput layer 5 , the number of neurons in hidden layer 11 , the number of neurons in output layer 1 , the number of iterations of 200 , the number of particles 20 , the value of learning rate $c_1 = 0$ and $c_2 = 2$, value of the inertia weight range wmak = 0.9 and wmin = 0.1 . While the composition of the data used is 50 % training data and 50 % test data . This combination obtain value of MAPE 0.3599 % , and the accuracy of direction prediction of 52.75 % .

Keywords : forex , time series , ANN , PSO , neurons , input layer , hidden layer , output layer , iteration , particles , learning rate , inertia weight , MAPE .