APPLICATION OF WAVELET RECURRENT NEURAL NETWORK FOR TIME SERIES DATA PREDICTION

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Abstract

Time series model is one of the forecasting techniques used to predict the future data by using historical data, meaning that what happens in the future is a function of what happened in the past. The selection of appropriate methods in predicting the data so obtained an accurate prediction result is the main problem in forecasting. One of the best forecasting method for time series prediction is to use Artificial Neural Network (ANN), especially recurrent Neural Network (RNN). Excellence has a layer RNN recurrent/feedback loop so that the RNN is better than a static feedforward especially in resolving problems that associated with time series data.

Wavelet is a function that can decomposition and reconstruct the data. This concept used to predict the time series data. The role of wavelets in the prediction of time series data for decomposition data before included on ANN, after a process of ANN data are reconstructed to obtain the results of prediction.

At the end of this task is discussed how the Wavelet recurrent Neural Network (WRNN) used to time series prediction. There are four wavelets used that is Haar wavelet, db2, db3 and db4. To determine the actual value of the approach measured using by MSE, the smaller the value of MSE means the data closer to the actual true value. Result of software testing, the best model in WRNN use db3 wavelet with 2-3-1 architecture, the value of learning rate = 0.02 and the value of alpha = 0.3.

Key words: Real-time recurrent learning, Recurrent Neural Network, Time series, Wavelet