



ARIMA-Wavelet Coupled Approach for Time Series Analysis

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ABSTRACT

Time series analysis is a statistical analysis that deals with time series data and trends. In the time series analysis, previous time raw data is required to forecast the future trends. This is very useful in all the areas of research. ARIMA (auto regressive integrated moving average) is one of the finest model in the time series, which is based upon the linear correlation. This is the only drawback of time series model that it can handled only linear systems. To remove this obstacle, wavelet model is introduces and clubbed with the ARIMA model for the better results. Wavelet Transform decomposes a signal into several groups (vectors) of coefficients and different coefficients vectors contain information about characteristics of the sequence at different scales. Being a highly empirical discipline, it forms the foundation for making inference like other scientific disciplines. In this paper, firstly, wavelet transform is applied to process a signal of time series data into constituent series and then forecast the values of constituent series by using ARIMA model. In this paper, time series data for sales per month of cars of a particular brand (Maruti Suzuki) in India from 2012 to 2017 is considered for the study. Two distinct approaches are explored and combined to get the predicted values of the time series accurately. The values of R-Square, RMSE (root mean square error), suggests that the coupled models performs better than the only ARIMA, time series model.

Keywords: Prediction Modeling, Sales Data, Wavelet Transform, ARIMA models.