Analysis of Training Function for NNARX in Solar Radiation Prediction Modeling

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Abstract Neural Network Autoregressive Model with Exogenous Input (NNARX) is one of the Evolutionary Neural Network that had been used to develop a prediction model for solar radiation which involves a dynamic non-linear for a time-series based prediction. The whole process of Training, Testing, and Validation of NNARX is carried out by using a Training Function. Since there are several improvements that had been made in enhanced the prediction results using NNARX, it is the best to setup an analysis on the Training Function in finding the best to suit the solar radiation prediction modeling. In this paper, the analysis of the Training Function algorithm for solar radiation prediction modeling development using NNARX is carried out using MATLAB R2019a software. Each Training Function algorithm will be used in modeling development and their prediction output will be compared with the actual output. Based on the results, it is shown that Levenberg–Marquardt Training Function is the best Training Function algorithm for NNARX in solar radiation prediction modeling with the coefficient of determination value, R^2 of 0.93423.

Keywords Training function · Neural network · NNARX · Solar radiation prediction · MATLAB

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