

USING MULTILAYER PERCEPTRON NEURAL NETWORK AS AN OPTIMAL REGRESSOR FOR DEMODULATION OF A TYPICAL FREQUENCY MODULATED SIGNAL

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Abstract

In this paper, it is shown that Multilayer perceptron Neural Network can elegantly solve a typical nonlinear multivariable regression problem of demodulation of a frequency modulated (FM) signal containing a sinusoidal message. This is a typical nonlinear multivariable regression problem. After rigorous computer simulations authors develop an optimal MLP NN model, which elegantly performs such a nonlinear multivariable regression. Results show that the proposed optimal MLPNN model has a MSE as low as 0.0004, correlation coefficient as high as 0.99961 when it is validated on the test dataset. It is also noticed that the output of the estimated MLP NN model closely follows the real one. It is seen that the performance of the proposed MLP NN model clearly outperforms the best RBF NN, FFNN, Jordan Elman NN and Modular NN model. The simple NN model such as the MLP NN with two hidden layers can be employed to solve such a nonlinear regression problem, is a major contribution of this research work.

Key Words : Nonlinear regression, MLP NN, FFNN, RBF NN, Modular NN, Jordan Elman network.