IMPROVE IN SPEED AND THE CONVERGENCE IN TRAINING PROCESS FOR THE PURPOSE OF SYSTEM MODELING USING HYBRID MULTILAYER PERCEPTRON (HMLP) NEURAL NETWORK

This thesis is represented in partial fulfillment for the award of the Bachelor of Engineering (Hons) Electrical Engineering Universiti Teknologi MARA

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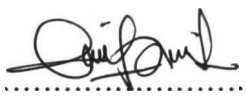

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DECLARATION

This thesis entitle "Improve in Speed and The Convergence in Training Process for The Purpose of System Modeling using Hybrid Multilayer Perceptron (HMLP) Neural Network" is a presentation of my original research work. Wherever contributions of others are involved, which are not result of my own work, have been clearly acknowledgement in this thesis. I certify that the work is original and has not been previously submitted for assessment in other course and institution, except where specifically stated.

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ABSTRACT

In this project, Hybrid Multilayer Perceptron (HMLP) neural network is used for system modeling to improve the speed and the convergence in training process. This project requires collecting of a raw material data from controlling devices Proportional Integral and Derivative (PID) control system from Modular Servo control system (MS150).The HMLP neural network program is designed using MATLAB. The HMLP network is trained using a Modified Recursive Prediction Error (MRPE) algorithm to obtain the appropriate parameter for the network. Based on the analysis of performance, the developed system is able to achieve high accuracy and minimum error. The accuracy is at the rate of 99.58%, while the error and Mean Square Error (MSE) are at the rate of 0.42% and 4.9840e-8. The analysis of the performance of the HMLP network has proven that it is suitable to be used in system modeling. The network strategy employed will result in fast speed of convergence rate if compared to the Multilayer Perceptron (MLP) network, but low speed in program running time because of the HMLP structure is more complex than MLP network. The HMLP network also indicates that the network models adequately represents the systems dynamic.