



A NEW MIXED LEAST MEAN SQUARE AND LEAST MEAN FOURTH ALGORITHM FOR MULTILAYER PERCEPTRON FAST TRAINING

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ABSTRACT—In this work a new fast training algorithm for the multilayer perceptron (MLP) is proposed. This algorithm is based on optimising a criterion formed from the Mean Squared and Mean Fourth power errors, resulting in a modified form of the Standard Back-Propagation (SBP) algorithm. In this criterion, the mean fourth power error signal is appropriately weighted. The choice of the weighting parameter is evaluated via rank convergence series analysis and asymptotic constant error values. The same minimisation procedure is used as for the SBP algorithm.

The performance of the proposed algorithm is compared with other existing algorithms such as the SBP algorithm, the Conjugate Gradient algorithm (CG), the Variable Learning Coefficient algorithm (VLC) and others. Many experiments have been performed to highlight the superiority of the new proposed algorithm in terms of reducing the number of learning iterations, computation time, sensitivity to weight initialisation and its effective generalisation setting.

Key Words: Multilayer perceptron (MLP); Fast training algorithms; Standard back propagation (SBP) algorithm; Least mean squared error; Least mean fourth power error