

INITIAL WEIGHTS AND BIASES TO BACKPROPAGATION IN FEED FORWARD NEURAL NETWORK BY PARTICLE SWARM OPTIMIZATION

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Abstract

This paper concentrates on the beauty of Particle Swarm intelligence in Neural Network optimization. Feed Forward Neural Network (FFNN) with Back propagation is used with initial guess made by Particle Swarm. The tendency of Backpropagation of getting stuck at local minima or local maxima is a bottle neck to many classification and prediction problems. The combination of particle swarm optimization (PSO) and FFNN greatly help in fast convergence of FFNN in classification and prediction to various benchmark problems without getting stuck. The benchmarking databases for neural network contain various data sets from various different domains. All datasets represent realistic problems which could be called diagnosis tasks and all but one consist of real world data. Three such databases are considered in this paper. The Mackey Series, Breast Cancer data and the Diabetic data. Results show that PSO improves the performance of Feed Forward Neural Network when trained with the weights and biases obtained by PSO as initial weights and biases.

Keywords: Particle swarm intelligence, feed forward Neural Network, Backpropagation, convergence, benchmark, realistic problems, prediction error, local minima, local maxima.