

I.E. Livieris and P. Pintelas. [An adaptive nonmonotone active set -weight constrained- neural network training algorithm](#) . Neurocomputing, 2019



Abstract - In this work, a new direction for improving the classification accuracy of artificial neural networks is proposed by bounding the weights of the network, during the training process. Furthermore, a new adaptive nonmonotone active set -weight constrained neural network training algorithm is proposed in order to demonstrate the efficacy and efficiency of our approach. The proposed training algorithm consists of two phases: a gradient projection phase which utilizes an adaptive nonmonotone line search and an unconstrained optimization phase which exploits the box structure of the bounds. Also, a set of switching criteria is defined for efficiently switching between the two phases. Our preliminary numerical experiments illustrate that the classification efficiency of the proposed algorithm outperforms classical neural network training algorithms, providing empirical evidence that it provides more stable, efficient and reliable learning.