

I.E. Livieris. [An advanced active set L-BFGS algorithm for training constrained neural networks](#)

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Abstract - In this work, a new advanced active set limited memory BFGS (Broyden–Fletcher–Goldfarb–Shanno) algorithm is proposed for efficiently training weight-constrained neural networks, called AA-L-BFGS. The proposed algorithm possesses the significant property of approximating the curvature of the error function with high-order accuracy by utilizing the {color{blue}theoretically advantaged} secant condition. Moreover, the global convergence of the proposed algorithm is established provided that the line search satisfies the modified Armijo condition. The presented numerical experiments illustrate the efficiency of the proposed AA-L-BFGS, providing empirical evidence that it significantly accelerates the convergence of the training process.