

I.E. Livieris and P. Pintelas, Evaluation of neural network training algorithms using biomedical data, Technical Report 08-02, Department of Mathematics, University of Patras, 2008.

**Abstract** - Artificial neural networks are very sophisticated modeling techniques capable of modeling extremely complex functions, thus they are being successfully applied across a wide range of problem domains, including the area of medicine. During the last decade, the application of neural networks for prognostic and diagnostic classification in clinical medicine has attracted growing interest in the medical literature. Nowadays, neural networks have been recognized as powerful predictive tools, to be considered routinely alongside standard logistic regression. However, there have been proposed several algorithms for neural network training and the availability of numerous different algorithms makes the selection of the proper algorithm rather difficult. The scope of this technical report is to investigate and evaluate the efficiency of the most popular gradient descent training algorithms in a number of biomedical problems using two types of neural network architectures. Our aim is to perform a large scale study on the behavior and the performance of the presented algorithms on clinical decision problems and identify their possible advantages and limitations.