Margin-Based Feed-Forward Neural Network Classifiers

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Abstract : Margin-Based Principle has been proposed for a long time, it has been proved that this principle could reduce the structural risk and improve the performance in both theoretical and practical aspects. Meanwhile, feed-forward neural network is a traditional classifier, which is very hot at present with a deeper architecture. However, the training algorithm of feed-forward neural network is developed and generated from Widrow-Hoff Principle that means to minimize the squared error. In this paper, we propose a new training algorithm for feed-forward neural networks based on Margin-Based Principle, which could effectively promote the accuracy and generalization ability of neural network classifiers with less labeled samples and flexible network. We have conducted experiments on four UCI open data sets and achieved good results as expected. In conclusion, our model could handle more sparse labeled and more high-dimension data set in a high accuracy while modification from old ANN method to our method is easy and almost free of work.

Keywords : Max-Margin Principle, Feed-Forward Neural Network, classifier, structural risk

Conference Title : ICSRD 2020 : International Conference on Scientific Research and Development

Conference Location : Chicago, United States

Conference Dates : December 12-13, 2020

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