FAST TRAINING ALGORITHMS FOR MULTI-LAYER NEURAL NETS

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Abstract

Training a multilayer neural net by back-propagation is slow and requires arbitrary choices regarding the number of hidden units and layers. This paper describes an algorithm which is much faster than back-propagation and for which it is not necessary to specify the number of hidden units in advance. The relationship with other fast pattern recognition algorithms, such as algorithms based on k-d trees, is mentioned. The algorithm has been implemented and tested on artificial problems such as the parity problem and on real problems arising in speech recognition. Experimental results, including training times and recognition accuracy, are given. Generally, the algorithm achieves accuracy as good as or better than nets trained using back-propagation, and the training process is much faster than back-propagation. Accuracy is comparable to that for the "nearest neighbour" algorithm, which is slower and requires more storage space.

Comments

Only the Abstract is given here. The full paper appeared as [1] and was presented as a Forsythe memorial lecture, Department of Computer Science, Stanford University, February 1990. The paper demonstrated a close connection between neural nets and older classification and data retrieval methods in common use by statisticians and computer scientists, and helped to introduce some realism into the debate on the capabilities of neural nets [2].

References

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2. F. Crick, "The recent excitement about neural networks", *Nature* 337 (1989), 129–132.

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