Abstract

Extreme learning machine (ELM) is a biologically inspired feed-forward machine learning algorithm that offers a significant training speed. Typically, ELM is used in classification applications, where achieving highly accurate results depend on raising the number of ELM hidden layer neurons, which are randomly weighted independently of the training data and the environment. To this end, determining the rational number of hidden layer neurons in the extreme learning machine (ELM) is an approach that can be adapted to maintain the balance between the classification accuracy and the overall physical network resources. This paper proposes a software based method that uses gradient descent algorithm to determine the rational number of hidden neurons to realize an application specific ELM network in hardware. The proposed method was validated with MNIST standard database of hand-written digits and human faces database (LFW). Classification accuracy of 93.4% has been achieved using MNIST and 90.86% for LFW database.
References


Index Terms

Computer Science Networks
Keywords

Extreme Learning Machine, Gradient Descent, Random feature mapping