Chapter 15
Netlab Training

ABSTRACT

This chapter is a brief review on the Netlab toolbox that works with MATLAB software. Some of the main functions are introduced and examples of using the Netlab toolbox are provided to support the explanation.

1 INTRODUCTION

Netlab is a toolbox composed of necessary functions and commands for simulation of neural network. It containes techniques that are not yet available in the existing packages. This toolbox is so helpful for solving the pattern recognition problem. All parts of the toolbox intract together in a coherent way and this is the reason of recommending the netlab for solving the classification and clustering problems. We have used Netlab for solving various classification problems such as Hepatities diagnosis, ECG signal classification problem. Below some of the important functions are provided that are frequently be used for implementation. All the information is from Netlab (Nabney, n. d.).

2 FUNCTIONS

Below some of the important functions in Netlab are introduced and explained in details followed by examples. In addition, Appendices D and E are two more dataset (Cancer and ENT) provided as an exercise to classify the datasets.

1. **Datread Function:** *Purpose* - Read data from an ascii file. *Synopsis:* [x, t, nin, nout, ndata] = datread(filename). *Description:* [x, t, nin, nout, ndata] = datread(filename) reads from the file filename and returns a matrix x of input vectors, a matrix t of target vectors, and integers nin, nout and ndata specifying the number of inputs, the number of outputs and the number of data points respectively.

    The format of the data file is as follows: the first row contains the string nin followed by the number of inputs, the second row contains the string nout followed by the number of outputs, and the third row contains the string ndata followed by the number of data vectors. Subsequent lines each contain one input vector followed by one output vector, with individual values separated by spaces.

2. **mlp Function:** *Purpose* - Create a 2-layer feedforward network. *Synopsis:*

```
net = mlp(nin, nhidden, nout, func)
net = mlp(nin, nhidden, nout, func, prior)
net = mlp(nin, nhidden, nout, func, prior, beta)
```

Description: net = mlp(nin, nhidden, nout, func) takes the number of inputs, hidden units and output units for a 2-layer feed-forward network, together with a string func which specifies the output unit activation function, and returns a data structure net. The weights are drawn from a zero mean, unit variance isotropic Gaussian, with varianced scaled by the fan-in of the hidden or output units as appropriate. This makes use of the Matlab function randn and so the seed for the random weight initialization can be set using randn('state', s) where s is the seed value. The hidden units use the tanh activation function.
    The fields in net are:

*   type = 'mlp.'
*   nin = Number of inputs.
*   nhidden = Number of hidden units.
*   nout = Number of outputs.
*   nwts = Total number of weights and biases.

18 more pages are available in the full version of this document, which may be purchased using the "Add to Cart" button on the publisher's webpage: www.igi-global.com/chapter/netlab-training/111012

Related Content

A Similarity-Based Object Classification Using Deep Neural Networks
Parvathi R.and Pattabiraman V. (2019). *Handbook of Research on Deep Learning Innovations and Trends (pp. 197-219).*
www.irma-international.org/chapter/a-similarity-based-object-classification-using-deep-neural-networks/227853

A Method of Predicting Moments of Market Trend Reversal for Decision-Making Block of Computer-Based Intelligent Financial Agent-Avatar
Vsevolod Chernyshenko, Vladimir Soloviev, Vadim Feklin, Mikhail Koroteevand Nikita Titov (2020). *Avatar-Based Control, Estimation, Communications, and Development of Neuron Multi-Functional Technology Platforms (pp. 1-18).*
www.irma-international.org/chapter/a-method-of-predicting-moments-of-market-trend-reversal-for-decision-making-block-of-computer-based-intelligent-financial-agent-avatar/244784

A Recurrent Probabilistic Neural Network for EMG Pattern Recognition
Toshio Tsuji, Nan Buand Osamu Fukuda (2006). *Neural Networks in Healthcare: Potential and Challenges (pp. 130-153).*
www.irma-international.org/chapter/recurrent-probabilistic-neural-network-emg/27276

Spiking Neural Networks for Robotic Applications
J. Dhanasekar, R. Monisha, K S. Tamilselvan, V. Seethalakshmiand Gokul Basavaraj G (2023). *Neuromorphic Computing Systems for Industry 4.0 (pp. 319-336).*
www.irma-international.org/chapter/spiking-neural-networks-for-robotic-applications/326843

Residual Life Estimation of Humidity Sensor DHT11 Using Artificial Neural Networks
Pardeep Kumar Sharmaand Cherry Bhargava (2020). *AI Techniques for Reliability Prediction for Electronic Components (pp. 81-96).*
www.irma-international.org/chapter/residual-life-estimation-of-humidity-sensor-dht11-using-artificial-neural-networks/240492