

Hand Written Character Recognition System Using Neural Network

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Abstract: In order to recognise the hand written character the system model is developed which is based upon neural network. MATLAB software including neural network tool box is used. The attributes and advantages which ultimately achieve the importance of design model with greatest ability. To interpret the meaning of complex or imprecise data available which is use to recognise the pattern and detect very easily which inherently difficult for human being and to any computer technique .In this technique the neural network is treated as expert which is use to analyse. Study is carried out using artificial neural network (ANN) which is an information processing model that is motivated by biological nervous system works such as human brain processes information. The comparative study to recognise the character is done using multilayer perceptron neural network (MLP), support vector machine (SVM), radial basis function (RBF) After studying it is found that percentage accuracy obtain in support vector machine is 90-100% and main square error (MSE) is least the, percent accuracy obtain in multilayer perceptron neural network is near about 80-90% and MSE is less so SVM is the best classifier so far as hand written character recognition system is concerned. MLPNN is slightly inferior in performance as compared to the SVMNN.

Keywords: Neural network: SVM, MLP, RBF, MATLAB, JPG images of 20 person's hand written character

I. INTRODUCTION

In modern world a great deal of activities and researches are going on to solve the complex problems. Among several problems the role of "hand written character recognition system" is significantly important. Neural network works like human brain which is information processing model symmetrical with the nervous system of human being in which neuron is the key element which works by integrating to solve complex problem. In order to recognise and to identify the character with clarity and transparently with full confidence with alphabet a-z or A-Z and numerals 0-9 several neural network like SVM , MLP, RBF, are used in most of the organisation , public sector , LIC, banking , crime investigation , this is the need of modern era

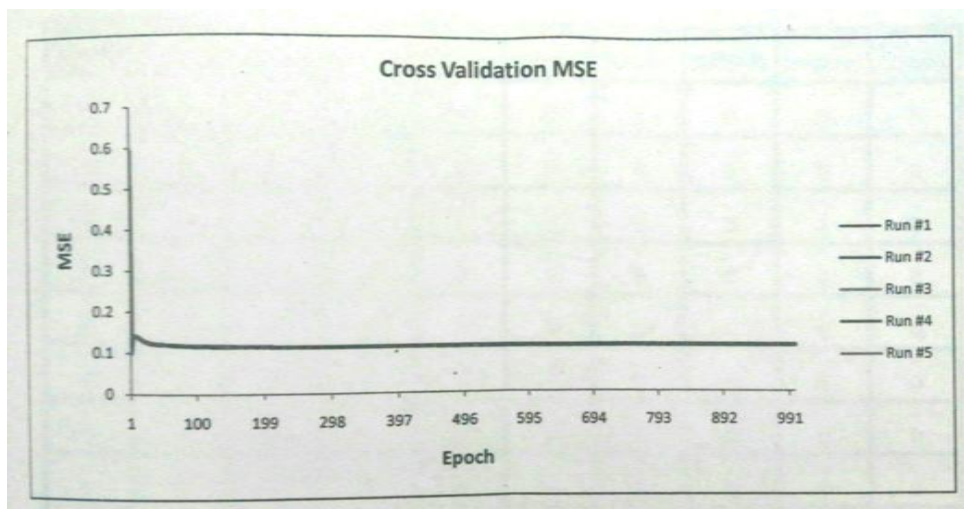
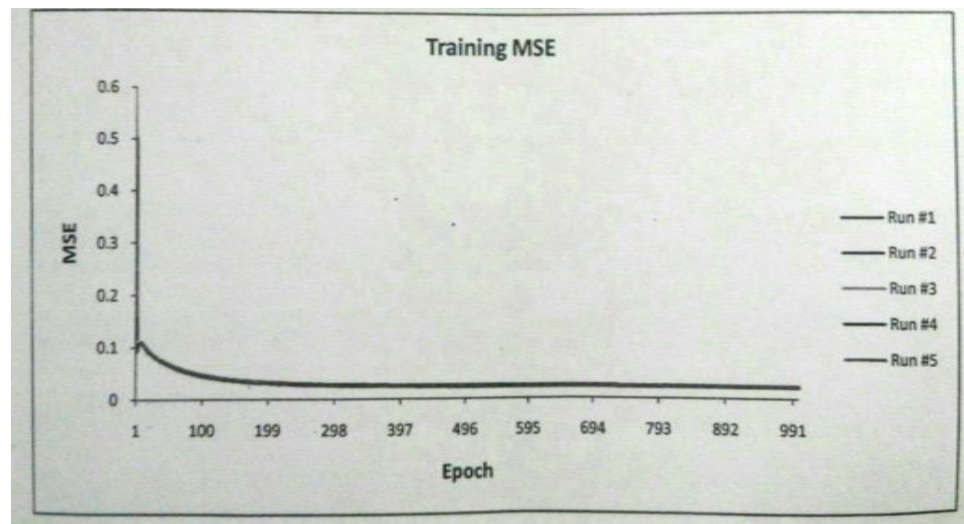
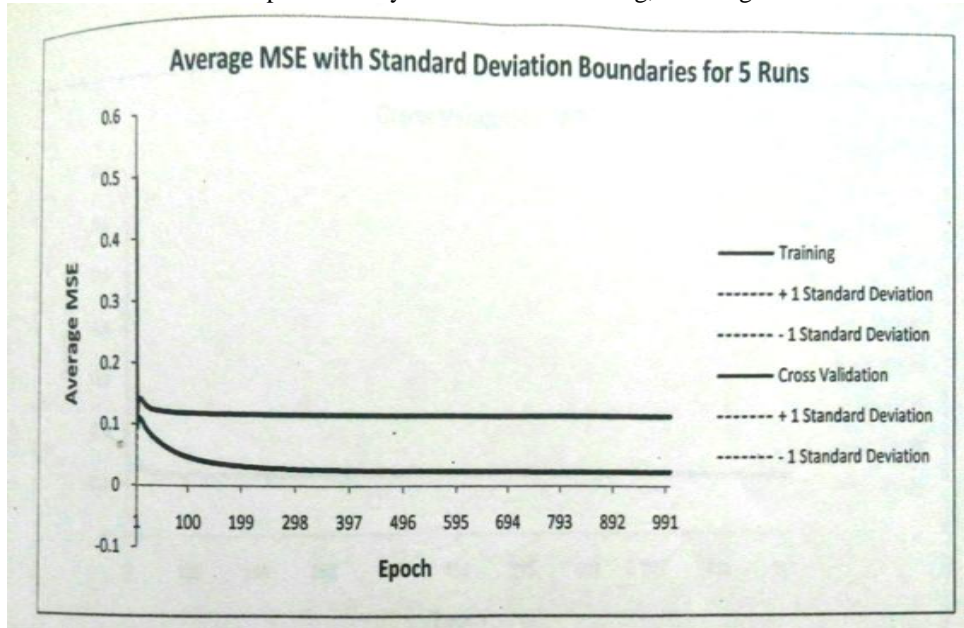
II. OBJECTIVE

To study the architecture of neural network: feed forward network, transfer function, hidden layer ,To study back propagation algorithm for SVMNN , MLPNN , RBFNN use of MATLAB as a software tools for design and analysis , statistics , signal processing and communication , image processing , testing and measurement , financial modelling and analysis to study basic idea of pattern recognition using neural network ,comparative study among SVMNN ,MLPNN,RBFNN then testing training and feature extraction ,preparation of JPG image of 20 persons image character ,data collection : name of 20 person and their information

III. METHODOLOGY

1. Preparation of 20 people's hand written characters ," India"
2. Each person will write character, "India" five times in a box (rectangle) provided of specified dimensions
3. Total(100) hand written character ," India " will be scanned and the image file will be stored in JPG format
4. 100 samples of ,"India" characters will be available for 20 different person of varying age and gender there after important features will be extracted from this characters and using this feature neural network will be trained following neural network are used for training and testing SVMNN ,MLPNN, and RBFNN
5. Performance of SVM based classifier on cross validation
6. Performance of SVM based classifier on test on testing
7. Performance of SVM based classifier on test on training
8. Step 5,6,7 are repeated for MLPNN,RBFNN
9. Comparative study is done among these three NN
10. Collection of randomised data and normalised data for this three NN
11. Graphical analysis for sensitivity of these three NN

Graphical Analysis in SVM for Testing, Training



Sensitivity of SVM

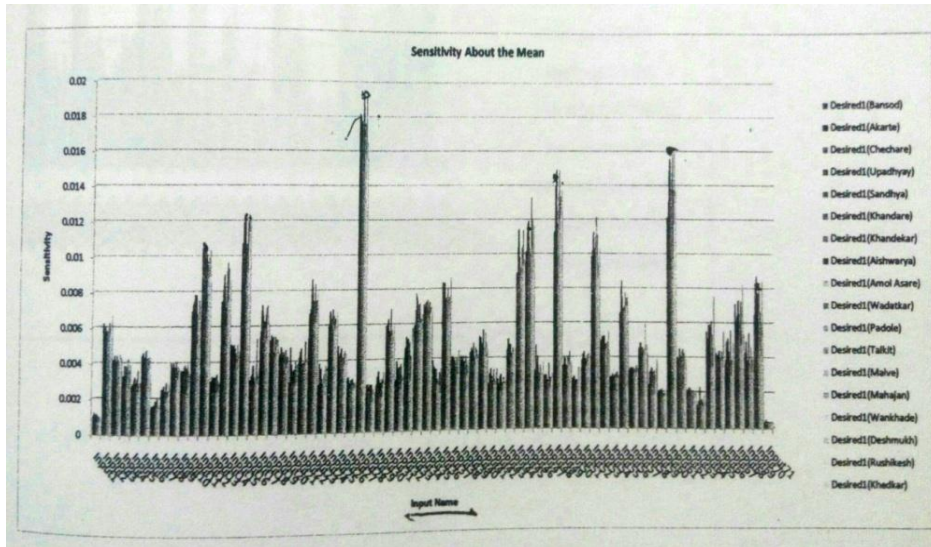


Fig. 1

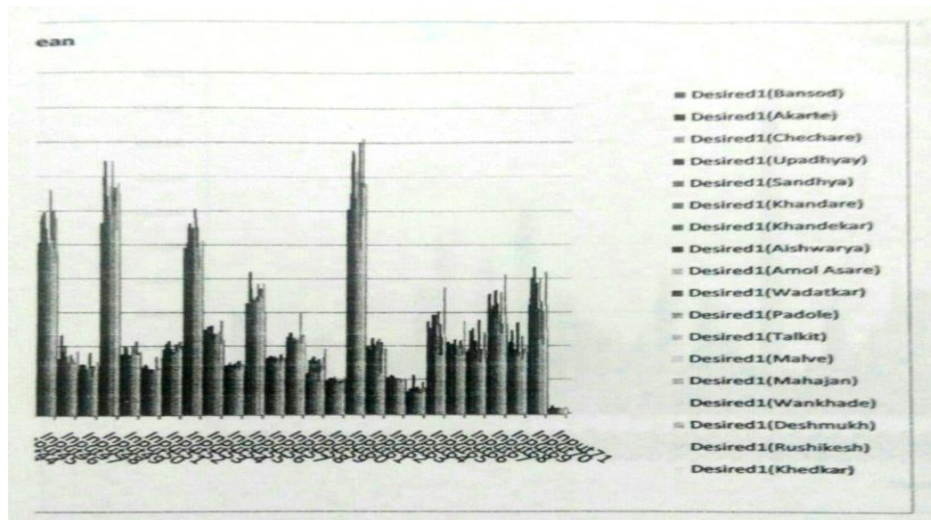


Fig. 2

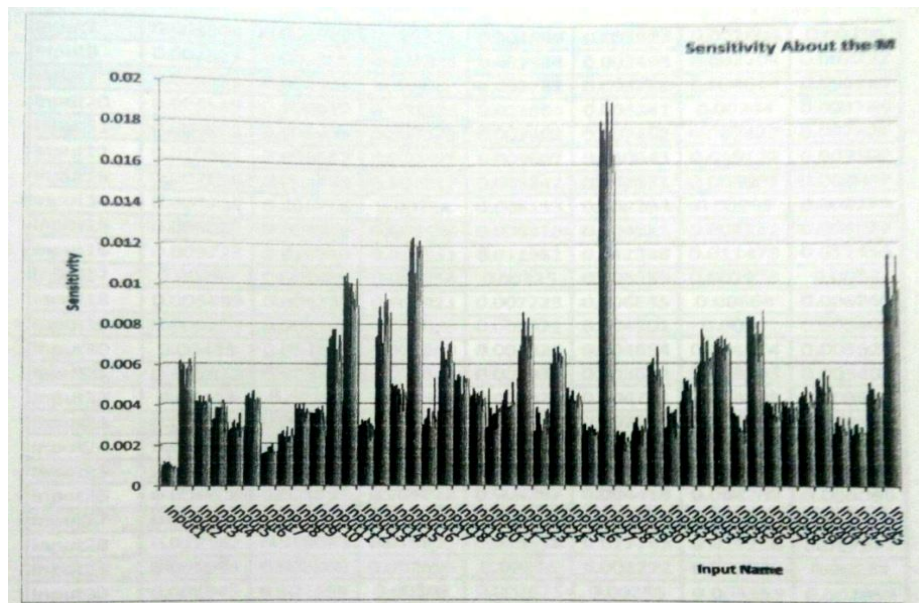


Fig. 3

IV. RESULT AND CONCLUSION

Hand written character recognition system using neural network is rigorously studied using SVMNN, MLPNN, and RVFNN. After studying it is found that SVMNN is the best classifier so far as the hand written character recognise system is concerned where as MLPNN is slightly inferior in performance as compared to SVMNN

REFERENCES

- [1] G martin and J. Pittman: recognition hand printed letter and digit using back propagation learning in neural computation vol3 No2 summer 1991
- [2] J. Pittman : Recognition hand written text in conference on human factors in computing 1991
- [3] S. Singh & A. Amin : Neural network recognition of hand printed characters in neural computing & application vol 8 no. 1 march 1994
- [4] Handwritten character recognition using neural network architectures (1990) [1 citation – 1 self] download: pdf | ps By O. Matan, R K Kiang , C.E. Stenard, B. J.S Denkar ,D.Henderson R.E. Howard W.Hubbard , I.d. jackel, y. Le curIn proceedings of the 4th united states postal service advance technology conference <http://www.research.att.com/~yann/exbd/publis/psgz/matan-90.ps.gz>
- [5] offline tamil handwritten character recognition using neural networks Ramarai N. GKM college of engineering and technology sutha J sethu institute of technology
- [6] Handwritten character recognition by using neural – network and euclidean distance metric sunita saha assam university- department of mathematics.
- [7] adaptive character recognition system using Alexander J. Faaborg cornell university , Ithaca NY (may 14,2002)
- [8] Handwritten character recognition using multiscale neural network training technique velappa ganapathy , kok leong liew
- [9] online handwritten character recognition using an optical backpropagation neural network walidA. Salameh princess summaya university for science & technology , amman , Jordan mohammed A. otairArab academy for financial science and banking , amman, Jordan walid@psut.edu.jo otair@just.edu.jo1
- [10] visual character recognition artificial neural networks shashank arakar* MGM's college of engineering and technology , university of Mumbai, india (shashank.araoksr@iee.org)
- [11] handwritten character recognition using low resolutions using low resolution authors : Bourkis N.G¹ .: kououtsougeras c.: jameel A.
- [12] stroke based handwritten Chinese character recognition using neural networks hong-yuan liao jun-shon huang shih-ta huang
- [13] handwritten recognition using neural network architectures matan , o. And Kiang , R.K. and stenard , c.e. and bosaer , B and denker, J.S. and Henderson , D. And horward, R.E. and hubbard , w. And jackel , I.d. and cur , y.le (1990) handwritten character recognition using neural network architectures. In proceedings of the 4th united states postal service advanced technology conference.
- [14] thai online handwritten character recognition using windowing backpropagation neural networks s. Sae-tang and i. Methaste(Thailand).
- [15] high accuracy handwritten Chinese character recognition using LDA-based compound distance authors tian-fu gao cheng-lin liu