

Artificial Intelligence Using Neural Network Based D. S. S. For Iris Detection

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Abstract:-

Neural network-based decision support system, is used for persons identification from IRIS recognition. In this case DECISION SUPPORT SYSTEM (D.S.S.) will work as a classifier estimate non linear and complex decision boundaries between different classes. The neural network configuration using MLP, RBF, SVM. The various parameter of neural network will be varied carefully in order to obtained the optimal configuration in view of minimum mean square error and maximum classification accuracy and simplicity of neural network model, the available data set ratio of these partition will varied gradually. In each of neural network configuration. The variable parameter test and train by neural solution software.

Finally an optimal neural network based D.S.S. will be designed in each category of neural network and then shall be overall comparison among different neural network configuration. In this case of decision support system confusion matrix and classify accuracy are important to identify person iris image.

Keywords: Iris recognition, neural network-based decision support system, Classify accuracy. MLP ,RBF, SVM

Introduction:-

Today's E-Security are in critical need of finding accurate, Secure and cost-effective alternatives to passwords and personal identification numbers as financial losses increase dramatically year over year from computer-based fraud such as computer hacking and identity theft. Biometric solutions address these fundamental problems, because an individual Biometric data is unique and cannot be transferred Biometric is automated methods of identifying a person or verifying the identity of a person based on physiological or behavioral characteristic.

For Example, of physiological char. Include hand, finger image and facial characteristic and iris recognition behavioral char. Are trends which can be learn or acquired dynamic signature verification, speaker verification and key stroke dynamic are example of behavioral char. Biometrics system uses a hardware to capture the Biometric information and software to maintain and manage the system in general, the system translates these Biometric profile known as template that templates is stored in a data base the Biometric system then compares this templates to the new image created every time a user accesses system then compares this templates to the new image created every time a user accesses the system for an enterprise Biometric provides value into two ways Biometric adds a unique identification to network authentication, one that is extremely difficult to duplicate smart cards and token also provides a unique identifier but an Biometric has an advantage over these devices a user cannot lose or forget his or her finger print, retina or voice the practical application for Biometric are diverse and expanding and range from healthcare to govt, financial services, transportation and public safety and justice. Such application are on line identification for E-commerce access control of a certain building or restricted area, offline personal identification, financial automated teller machine (ATM), online ticket purchase etc.

Feature Extraction

In order to provide an accurate recognition of an individuals, the most discriminating information present in an iris pattern has been extracted. Only the significant features of the iris have been encoded so that comparison between templates is done. the feature extraction stages.

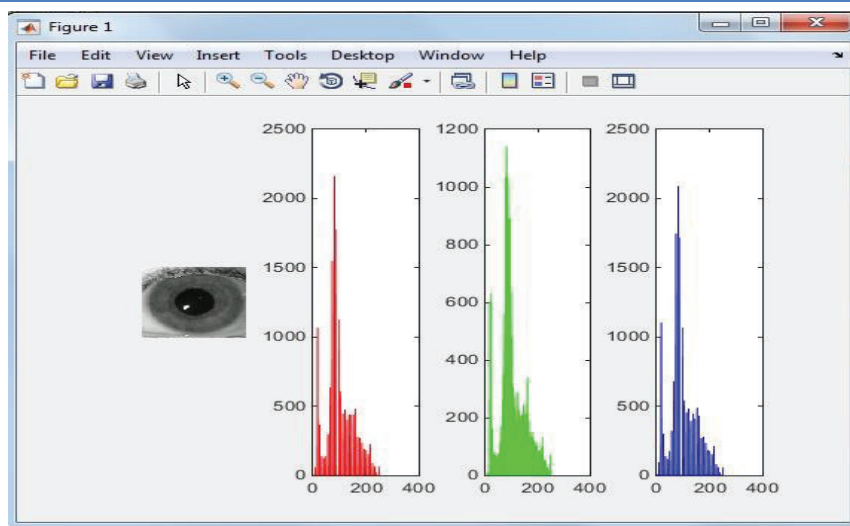


Fig , Histogram of Iris

Problem Formulation :- In this paper preliminary part of the work is given .

Neural network based decision support system, is used for persons identification from IRIS recognition. In this case the D.S.S. (DECISION SUPPORT SYSTEM) will work as a classifier estimate non linear and complex decision boundaries between different classes. The neural network configuration to be used for this research work are as

- 1) Multilayer Perceptron (MLP)
- 2) Radial based function network (RBF)
- 3) Self Organizing map (SOM)
- 4) Support Vector Machine.

The various parameter of neural network will be varied carefully in order to obtained the optimal configuration in view of minimum mean square error and maximum classification accuracy and simplicity of neural network model, the available data set ratio of these partitions will varied gradually. For e.g. 70% training, 20% testing, 10% cross validation and various possible combination like permutation and combination like this will be form. The order of testing and training will be swapped for reverse tagging. The different data partitioning ensures that the trained neural network s not dependent on any specific data partition to produce the best results and the learning is almost independent of data is essential. In each of the neural network configuration. The variable parameters are as Hidden layer, Number of neurons in each hidden layer, Transfer function of neurons output layer, Learning rule or training algorithm to be used such as standard back propagation algorithm, conjugate gradient algorithm, delta algorithm and quick propagation , Number of cluster Centers, Learning rate and value of step size and momentum. All possible Variable parameter of neural network will be varied systematically until the most optimal configuration is reached, where mean square error on the training, testing and cross-validation data set is the lowest regardless of data partitions and classification accuracy for cross validation and testing data set will approach 100% ideally. Finally an optimal neural network based D.S.S. will be designed in each category of neural network and then shall be overall comparison among different neural network configuration. In this case of decision support system confusion matrix and classify accuracy are important to Identify person iris image. In this case mean square error is not very important digestive parameter, it is only used to control and monitor learning algorithm and training of neural network, neural network is trained on the different data partition and it is tested on a separate data partition that was never presented to neural network, while training. This is done for proper generalization and true learning.

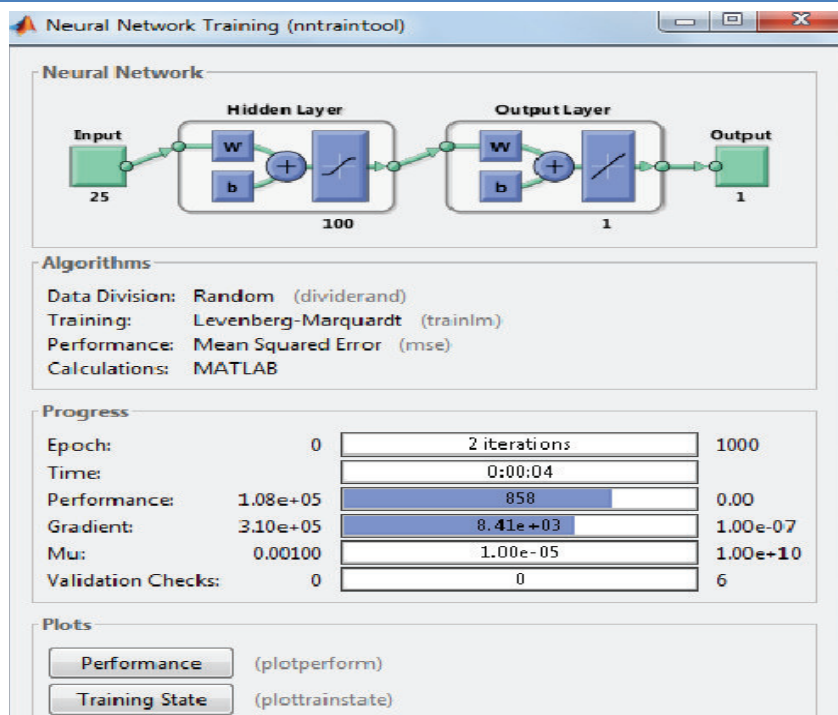
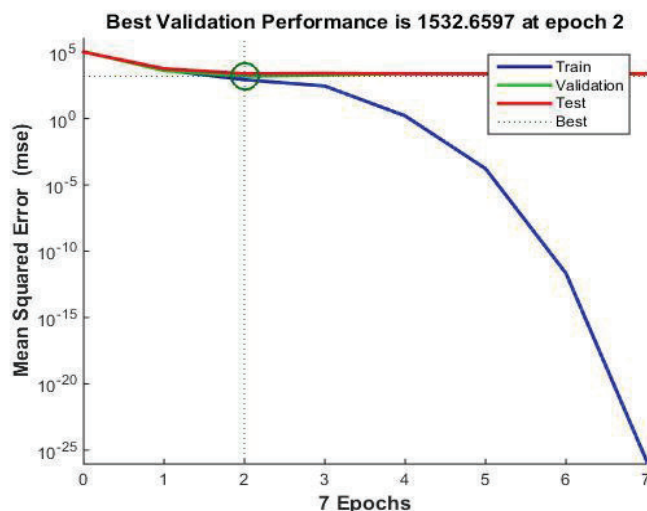


Fig. neural network training

If the train button is pressed on the menu the neural network training (ntraintool) would be activated from the neural network toolbox. The result of train network is shown in fig 4.1

In this figure the neural network algorithm would be displayed with 25 input two layers with weight and bias. Hidden layer are 100 and one output layer. According to the present result of training system the epoch is 2 iteration for 1000 epochs. Running time is 0.004 hours. The performance is 858 for 1.08×10^5 target. The gradient is 8.41×10^3 for 1.00×10^{-7} and validation check is 0 for 6 must be displayed on the command window.

According to the fig 4.1 the neural network training system has been accomplished and known by the user neural network toolbox is very useful to simulation of this right iris recognition.



The result is found by the algorithm and we can get the number of epochs used and which epoch gives the best result as shown in fig 4.2. As shown in fig 4.2 a plot of epochs MSE has been plotted. The epochs get the best validation performance at epoch no. 2. The MSE is the lowest at this point and hereafter no significant changes take place and no further decrease takes place. Hence this is the best validation performance is 1532.6597 at epoch

Conclusion:-

In this the iris preprocessing steps that includes iris localization, normalization and enhancement and then applied to the small singular program on MATLAB. Software converts that image into the numerical data.

Numerical data then applied to the Neural solution and then trained the Network and classify the images using multilayer perception (MLP), Radial based function Network (PDF) and the images and gives the accuracy of that images. In this work, Iris recognition system based on neural networks base decision support system is used for persons identification from iris images. Multilayer perceptron network is one of the best techniques to identify Iris images of a person.

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