



Identification of Olive Ridley Sea Turtle Using Two Software Tools

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Abstract

There are abundant neural network packages available to train the data sets .In this paper two software namely neurosolutions and matlab is compared to verify the efficiency of prediction of training data sets. The present study deals with the identification of olive ridley sea turtle. This image is initially extracted with its unique features namely, shape, color, length and breadth. These feature extracted image is taken for training and testing for image classification. The performance of training is measured through the time consumption in training the data sets and error rate while training the datasets. The algorithm for this training is feed forward neural network. This algorithm is tested in two different tools and the performance is measured in graphs.

Keywords: Feature Extraction, Feed forward Backpropagation neural network, neurosolutions.

1. Introduction

The aim of the paper to identify the particular species of sea turtle using feature extraction and train these images in two neural network software packages namely neurosolutions and matlab. These ANN technique used in modeling the performance in thermal systems see in “Performance Comparison of Matlab and Neuro Solutions Software On Estimation Of Fuel Economy By Using Artificial Neural Network”[1]. The feature extracted MRI brain images are trained in the feed forward neural network to classify the images which are seen in “An Elegant Approach for Diagnosis of Parkinson's disease on MRI Brain Images by Means of a Neural Network”. In these two papers the image are extracted and trained in neural network to measure the efficiency of classification of images

2. Methodology

The present study deals with the training of 30 feature extracted images in two different neural networks software's. When the olive ridley sea turtle image is acquired the image processing technique is implemented were the first the edge is been deducted to deduct the particular portion of the image is deducted. Then the color is deducted using datacursor mode .Finally length and breadth is measured using GINPUT function in matlab. After the process of feature extraction the images is classified in 3 different categories

1. Type 1 image: The turtle image looks same as in the threshold range of feature extraction which is clear and easily recognizable.
2. Type 2 image: The image which does not match is almost equal to the threshold range.
3. Type 3 image: The image which is not matches with the threshold range.

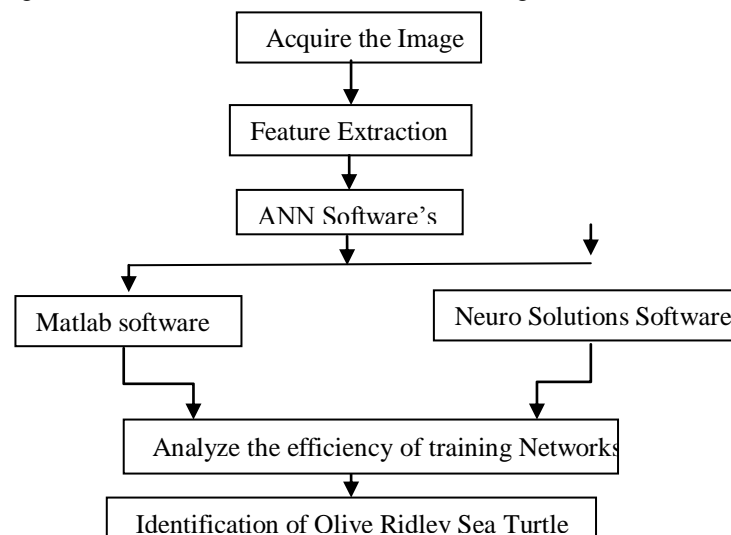


Figure 1: Image classification using ANN software

The figure 1 which discusses the process of image classification by using different software's to measure the training time. The first step in this process to acquire the input image was the 30 images are taken for training and testing. Then these raw images are been feature extracted using matlab tool. Finally the processed image is thrown in two software tools of neural network were both the software follows the feedforward algorithm and time duration is measured for efficiency of the software in training the images.

2.1 Feature Extraction:

In this feature extraction process the four features namely length, breadth, color and shape is extracted. The length and breadth of the image is measured using GINPUT function for which threshold range is assigned. The color of the carapace in image is measured using DATACURSOR mode where each pixel data is driven separately so that range is allocated as threshold value. Finally to extract the particular shape circle masking is done so that particular part of the image is separated. This threshold range is explained in table 1.

2.2 Artificial Neural Network:

The artificial neural network is an information processing system in which each element is called as neurons. The signals are transmitted by connection links, where each link possess an associated weight which are multiplied along with the incoming signals (net input).

2.3 Matlab Feedforward Backpropagation neural network classification:

The feedforward Backpropagation neural network is one kind of classification network which consists of simple neuron like preprocessing units and organized layers. Each unit in the layer is connected with all the units of previous layers. The data enters the input unit where it passes each network until it reaches the output. During the classification of the images there will be no interaction (or) feedback from the layers so this network is known as feedforward network.

There are two main phases in the networks namely learning phase and classification phase. In these two phases the image is been classified and performance is measured through time taken for the training the networks.

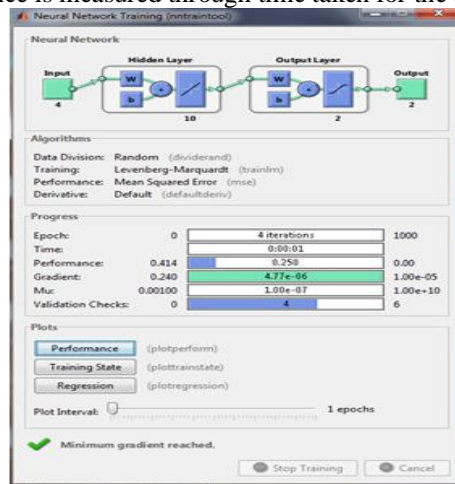


Figure 2: Feedforward Backpropagation Neural Network

The figure 2 which represents the feedforward backpropagation neural networks with 4 input values of feature extraction namely shape, color, length, breadth. The expected output is tested for whether the image is olive ridley or other images.

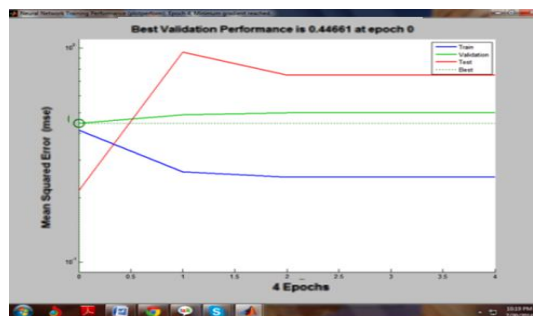


Figure 3 : Mean Square Vs Epoch

In the figure 3 , shows the difference between expected target data and the actual simulation of neural network. The best performance occurred at epochs 4 . The training stops when mean square error of validation samples started to increase.

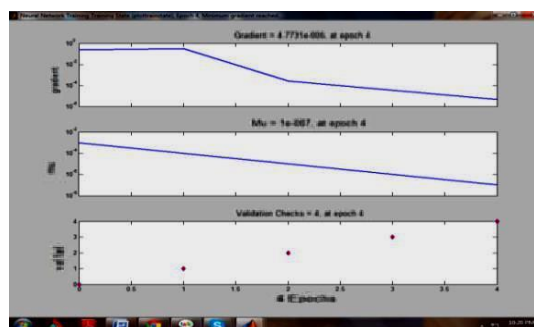


Figure 4: Train State Graph

The figure 4 shows the training state graph which predicts the difference between the test and training of data. The difference lies around 0.001 which is low error rate. The third graph shows the validation state which increases from 1 epochs and finally reaches the maximum validation state of 4 epochs.

2.4 Neuro Solutions Software:

The neuro solution software is modular and icon based network design interface. The neuro solutions have two separate wizards namely Neural Builder and Neural Expert which build networks automatically. Once when we choose neural architecture we can customize the parameters such as hidden layers, the number of processing elements and learning algorithms. The feedforward backpropagation neural network is connected for identifying olive ridley sea turtles where the 4 parameters namely length, breadth, shape and color of the image is extracted. The threshold values of these parameters are given as an input in neural builder using neurosolutions.

The network consist of 4 inputs values and 2 output values. The network is trained the weights of the system are continuously adjusted to incrementally reduce the difference between the output of the system and the desired response. The difference is measured using error rate. The most common measurement is the Mean Square Error (MSE). The MSE is the average square of the difference between each output and desired output.

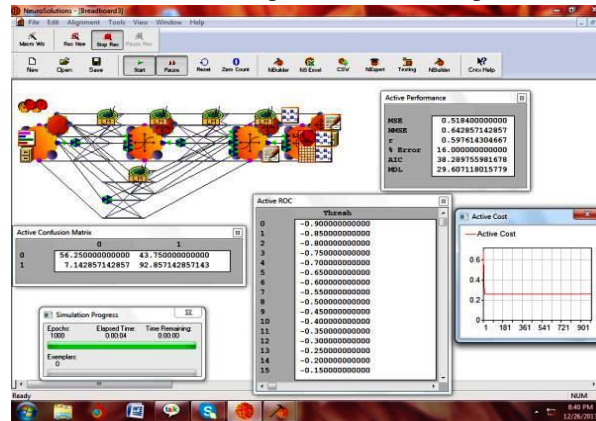


Figure 5: Designed Feedforward Backpropagation structure of Neurosolutions

The figure 5 shows the detailed feedforward backpropagation using neurosolutions software with screen shots after finishing the training process. The simulation window specify the training process by showing the number of epochs sent through ANN , number of data exemplars sent through ANN and finally to analyze the elapsed time and estimated time to complete the training of the networks. This active cost shows the measures the accuracy of the predicted data points in relation with the actual or desired values. During the training, the active cost matrix shows the error curve that is automatically generated as the network weights are repeatedly modified during the training to reduce error. It is noticed that the MSE is equal to 0.5184 and the error rate is reduced by 16.00 .The training stops when the Mean Square Error reaches the desired threshold range values.

2.5 Analyze the efficiency of training of Networks:

The comparative analysis is made between the two software’s namely matlab and neurosolutions in which the training time and the performance of reduction of error is uniquely measured this is clearly explained in table 1. The comparative analysis shows that the matlab gives the less error rate and fewer training time as compared with the neurosolutions software tool.

Table 1: Comparative Analysis of Two Software’s

Software’s	Number of Epochs	Error Rate in Training the Networks	Training Time
Matlab	1000	0.001	0.00.01
Neurosolutions	1000	16.00	0.00.07

The table 1 clearly states the performance of two software’s is measured to identify the olive ridley sea turtle in which the performance shows that the matlab software is faster in training time and reduction of error as compared with the neurosolution software.

3. Conclusion

This paper shows the identification of olive ridley sea turtle by using the two software’s namely matlab and neurosolutions in which the testing and training is made to calculate training time and error rate of the networks. The matlab gives the better performance than the neurosolution software as it is explained in the above performance graphs. However, in futures these comparisons can be made with the other softwares like DTREG were the performance analysis can be made.

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