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# IDENTIFICATION OF THE PERSON THROUGH THE IRIS OF THE EYE

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**ABSTRACT**: *The identification of a person through the iris of the eye of the very important issues to prove his identity. It was a preliminary treatment of the samples used in the study program. Then the samples classified into four groups namely (flower iris, jewels iris, shaker iris and stream iris. Have been through the program to find statistical features of each sample from each group and then re-create these features by way wavelet using MATLAB software, and these samples were (1) (15image of the iris of the type flower iris). (2) (15image of the iris of the type jewels iris). (3) (15 image of the iris of the type shaker iris) (4) (15 image of the iris of the type stream iris). When treatment was extracted a number of Mini (mean, std., var., Energy, Homogeneity, and Entropy). Features that represent each iris were used artificial neural network with a reverse spread as a way to distinguish. The four varieties and the number of inputs to the neural network Is six (the number of statistical features used) for all samples were neural network training them and extract precision results to distinguish primary treatment samples. Conversion technology application wavelet using the study samples and extract the same as the previous samples after image processing and conversion wavelets using (wavelet-2D) a reverse spreading neural network as a way to distinguish the four varieties previous input itself For all samples)*

**KEYWORD**: Flower Iris, Jewels Iris, Shaker Iris and Stream Iris, Mean Std., Var., Energy, homogeneity, Entropy. Artificial Neural Network.

## INTRODUCTION

Use it vital features which they can identify people and those vital features fingerprints, face, eye and hand Engineering imprint. And it came to the scientists and researchers to use dynamic features based on Alvesaolgah characteristics as it is safe methods to identify people with the inability to borrow and rigged and stolen or forgotten. Vital features are automatic methods by which to identify people based on physiological or behavioral characteristics that can be used in security systems to help protect property and other [1]. One of those features that can be measured (fingerprint, face, hand geometry, fingerprint and eye). The biotechnology traits became the basis for a large-scale and high level of protection in the identification and verification of personal information. The more security breaches and swindlers have increased the need for a high degree of security in the identification Personal check based on the vital features .Valhalla able to provide the privacy and confidentiality of financial transactions and personal data, as is the need to use dynamic features in all government departments and financial applications, sales, health and social services, as well as in security applications (2), such as the way in and select crimes and border security of these vital features of Iris.

Had had participated in more than one property and convergence, even if they were the same person, every eye is different from the other in terms of size and strength of its sights.

## REFERENCE REVIEW

The idea of using iris recognition to identify people and to distinguish them in 1949 in a book by James Dugart In 1987 and officially recorded eye doctor Americans Maver Warren and Leonard Flom and asked Daugman since English and teacher at the University of Cambridge, the study of Iris use Daugman Computer and Camera infrared images of the distribution of the eye muscle fibers then addressed the images obtained by a computer program and about the pictures into digital data and then held 30 million compared to the process of recipes Irises eyes that forms translated into digital data did not find the identical irises. And managed Daugman to score devised in 1994 to take care of this new technology and the foundations of the three scientists Iris can Foundation in 1995 to take care of this new technology. And branched ones Tec ESTABLISHMENT pupillary. It is now the leading company in the development and researches your survey pupillary. and marketing at the present time to get to know people and there are 50 workers determine the shape of the eye footprint and make it a personal card distinct and individually [3] Applied this technology in many of the banks of England, Japan, America and Germany in 1997 and began airports also applied to Modfaha and passengers Aldaúmyin Kddm (4) search for the system to identify the iris of the eye, which was tested using two bases of the pictures in order to verify the iris recognition .osgel Technology good results and concluded that there are still some factors should be taken into consideration, such as the use of a few such as his command precision Awaladsat Adhesive available and that can change the color of the iris of the individual[5].

Daouk, et al in 2002 the new algorithm was presented in iris recognition system. And applied to 60 images and concluded that the new algorithm has achieved success by 96%

-Rejoin used in 2007 in the way of fingerprint recognition, as was the use of different images of fingerprints Fingers to a number of people as to the definition used Multiwavelet Transform Which requires a simple method of calculation is complicated to extract the salient features of the fingerprint and then use a neural network classification. [6]

Suggested Ammar in year2012 [7] a way to distinguish face of referring to two different first two applications is specifically recipe workbook of the face either known or unknown after comparing it with the well-known individuals in the database, has been proposed technique to distinguish the image of the second face support this technique to derive properties using two levels of Multi- *Dimensional wavelet Transform MDWT.*

**The theoretical side:**

Iris consists of a set of holes and cracks. Which is concentrated around each pupil, which vary from one person to another, in terms of number, shape and even the distance between them, as well as the colorful qualities of the iris vary from one person to another, even if they were engaged in the degree of color, because there are significant differences within the same color, In this unique footprint Altafrdh eye is formed, and is the imprint of the iris of the best security methods that enable confirm the identity of the person.

Featuring iris of the eye, including the following: [8]

1-Fixed not change a lifetime.
2- High accuracy with ease of use.
3- In humans there is no stare Haddguetan alike, even in identical twins,

4-The person does not need to bring a sample of the lens, as it could look at his camera on a 30-cm.
5- Drawing fixed iris longevity as composed after 6 months of birth, and continues after years of age to death.
6- Identify the imprint of the iris of a person cannot take more than a few second.

**Digital image processing:**

Debriefing the image and image processing systems are used in many applications, especially automatic control applications. [9]

The conversion of modern wavelets transfers and task used by researchers in image processing data through the detail that is the image suitability for the application of the digital computer directly [10]

**The basics of digital image processing:**

These applications are not limited to those that have entry and exit of the image, but extend to those that have entry and exit of image characteristics and attributes we get from the picture. In the following clarification of the application of image processing which respectively.[11],[12].

1- Image Enhancement.
2-Image Restoration. Which is based on some statistical or mathematical models for image processing?
3-Color image processing. It can extract some of the features and characteristics of the image based on color.
4-Using multi-resolution processing wavelet used in image compression and data.
5- Image compression. Is used in the reduction of the size of the memory required to store the image.
6-Morphological processing. Interested in using the image components.
7-Segmentation. Interested in dividing the picture to the elements.
8- Representation and Description. Representation as boundary or Regional.

**Objective of the study:**

This study aims and depending on the image processing techniques and a number of statistical standards for digital images and techniques of pattern recognition neural networks with reverse proliferation and using the program Matlab 2012a to prove the identity of the people through the iris recognition.

**Digital Image processing:**

Digital Image: The picture is a two-dimensional format and expressed figures each consisting digital image on the computer a set of pixels, and the pixel is the smallest unit in the picture and every image is a matrix containing rows and columns of pixels, and the greater the number of pixels was clear picture [13]

.

$$f(x,y) = \begin{pmatrix} f(0,0) & f(0,1) & . & . & . & f(0,M) \\ f(1,0) & f(1,1) & . & . & . & f(1,M) \\ . & . & . & . & . & . \\ . & . & . & . & . & . \\ . & . & . & . & . & . \\ f(N,0) & f(N,1) & . & . & . & f(N,M) \end{pmatrix}$$

Classified images to:

1- Binary image.
2-Gray scale image. And represent figures from 0 to 255, zero represents the color black, one is white color.
3-Color image.

-Artificial neural network:

It is a system of programs and data structures that approximate the human brain works means artificial neural network in the IT field, artificial neural network includes a large number of processors working in parallel, and then begin the primary case of neural network synthetic training process. Then guided the program to how to respond to Foreign institutional the heritage that can be input from the person who uses the system or possible to begin the implementation of the program itself a particular task that artificial neural networks based on simple mathematical models have certain performance characteristics of style simulates neural networks Albaalogih. [14}

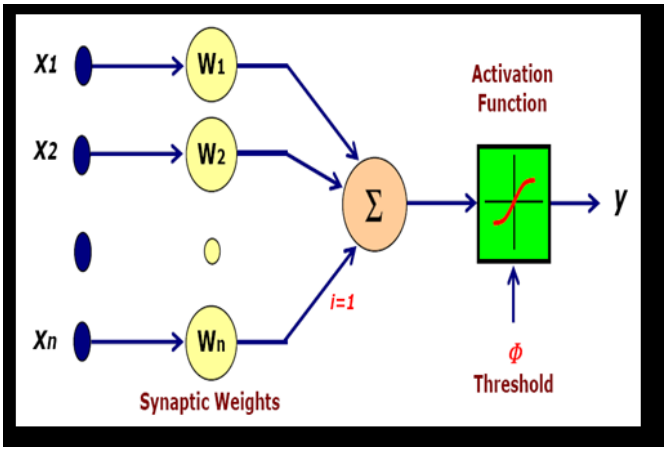



**Fig (1): Represents a form of artificial nerve cell.**

And when used in the nerve cell of this type of learning algorithm applied regardless of the complexity of the network or ease through the following steps [15].

1-Application output required result (data output).
2-Account neuron output and calculates the current error.

3-Transfer the value of the total error to all neurons in the network in proportion to the current weights and delivery of this cell-cell output.
4-The use of the specified error for each neuron in training in the usual way and details of these measures are very complex, and more names, calling this process is the reverse reaction.

Artificial neural network systems Features [16].

1-Ability to interpret confusing or incomplete data.

2-The ability to cope with new brands problems.

3-Parallel processing.

4-Flexibility and ease of maintenance of the system.

**Neural network Back-propagation:** that this method has become a mainstay in the neural accounts and its successful applications in a wide range of areas to solve problems such as signal filtering and pattern recognition. [17]

And enjoy this kind of artificial neural networks mathematical foundation and artificial neural network with a reverse spread can be used to solve the problem of received field patterns as receive network-style home and extract pattern outside.[18].

The artificial neural network training using reverse deployment includes three stages are as follows.

-Forward deployment stage.
-Rear prevalence stage.
-Phase synthesis weights of the network.
-The algorithm can be summarized or systematic work of these networks following steps.

1-Generating initial values of the weights of statistical distributions.[19]

2-Each node in the layer receives input signal their income and then sent to all the hidden layer nodes. [20]

3-Gathered each node in the hidden layer of income signals stored values.[20]

4-Continued application of activation to estimate the hidden layer output ($h_j$) and send the activation values to all the nodes in the output layer. [21]

5-Each node in the output layer income weighted signals gathered under the equation. [22]

$$K_Y=2 / (1+\exp (\sum h_j w_{jk}))-1 \quad \text{---------- (1)}$$

6- Calculation error output node by calculating the difference between the value of any node activation outputs $Y_K$ real value of the node, meaning the target ($t_k$) any [22].

$$E_k= t_k - y_k \quad \text{---------- (2)}$$

As they are compared to the output of the network with real values to estimate the value of the error ( $\delta k$ ) the equation.[22]

$$\delta k =(t_k-y_k ). F(v) \text{----------(3)}$$

Accounting f(v) function Tansig when they are non-linear output node is equal to one in the case that a linear function. [21]

And then calculate the change in the size of the error Δw jk equation [22].

$$\Delta w_{j\,k} = \alpha . \delta_k . h_j \text{ ---------- (4)}$$

7-Gathered each node in the hidden layer to the input signals weighted ($\delta_k$) under [21].

$$\Delta j = \sum \delta \text{ kw j k ---------- (5)}$$

And then multiply this value to calculate the activation poodle ($\delta_j$) and then calculate the change in the size of the error ( $\Delta vij_j$)under the equation. [22].

$$\Delta v_{I\,j} = \alpha . \delta_j . x_j \text{ ---------- (6)}$$

As the ($x_j$) represents the network inputs, $\alpha =$ the learning speed.

8-Reload weights of each node in the output layer (w j k) under the equation [22]

$$W\ j\ k\ (new) = w\ j\ k\ (old) + \Delta\ w\ j\ k \text{ ----------(7)}$$

And then update the weights for each node in the hidden layer under the equation. [22]

$$V_{I\,j}\ (new) = v_{I\,j}\ (old) + \Delta\ v_{I\,j} \text{ ---------- (8)}$$

9-The network will continue to update the weights (ie, the learning process) and (training) to be obtained for the optimal weights, and thus get the desired output to reach any better documentation of the model be studied. [23]

Represents the shape (a) Front Traffic active node process across the network from the node input and spread back of the contract outputs to inputs contract, [24]

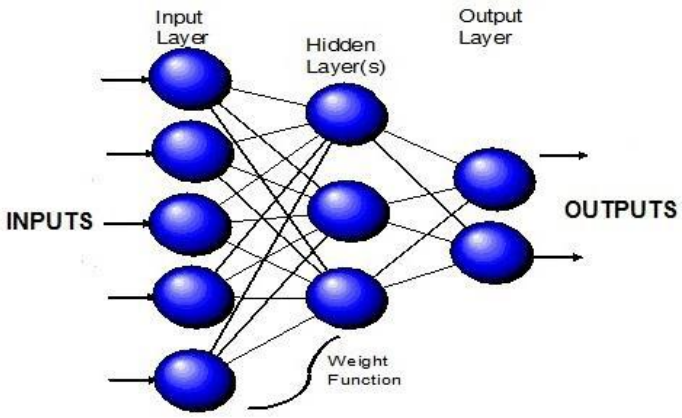



**Figure (2) artificial neural network with reverse proliferation. [24]**

**Pattern recognition using artificial neural networks:**

Pattern recognition or recognize patterns or identify the models, which is a branch of artificial intelligence, as it can be defined pattern recognition Bane Rated Input to varieties data to

establish its identity by extracting properties, or treatment, or task bodies of data, meaning that any program that treats the image gives rated or definition of the image [25] as in the following chart:

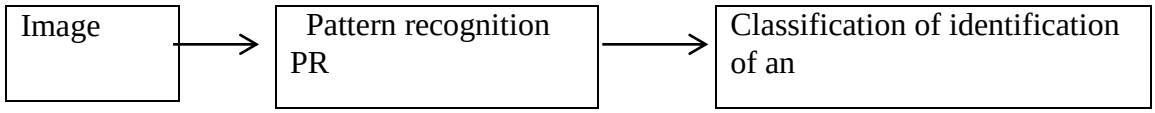



**Chart (1) shows the pattern recognition. [26]**

**Wavelet Transform:** In wavelets conversion are dealing with images, through the details that result from the analysis of the image into several levels. And any number of sub-images, also has an advantage in its suitability for practical application of the digital computer, and directly and which is one of the most important applications in the field of digital images that are used wavelets conversion processing. [27]

Properties of wavelet transform [28], [29]:

a-The conversion gives information on the location in the time domain and frequency.

B-wavelet conversion separation of reference compounds in both time and frequency allows.

C-wavelet conversion has a great interest in the gradual transmitter. Compared to other methods traded, the retrieval wavelet photo conversion process to be very suitable for the process of compressing digital images.

**Strengthen the Edge with wavelet:**

The aim of strengthening the edges of the image is to highlight the fine details of the image. The exact details are in the first level is the edges of the roughness and when we continue the analysis of more than one level, the results are more rich, that the process of strengthening the edges of the image is done through tightening strap detail any packets( LL,HL,LH ,and HH). The fine details in the first level is a coarser edges and when we continue the analysis of more than one level, the results are more rich, that the process of strengthening the edges of the image is done through tightening strap detail any packets. It means (low, low) of the order (LL). (High, low) for (HL) (low, high) in order to(LH), (high, high) in order to(HH), beat her by a factor which is the amplification, which are worth more than one when we want to exaggerate the details and be worth less factor one when the image is blurry.[30] . And design a mechanism for determining the changing factor amplification values based on the use of the decay factor, it can be through multiplication with a factor that leads to a decrease in transactions when moving from a soft one level to fine level is higher than if the value is less decay coefficient of one, it will reduce the amount of the last factor, which will lead to reduced amplification edges in the details of the analysis of the level of the soft top operation and after the completion of the strengthening of the edges on images conversion, the process improved the image is retrieved using the conversion reverse wavelet process value [31]. And shape (p) shows the flowchart to strengthen the edges of the image [32].

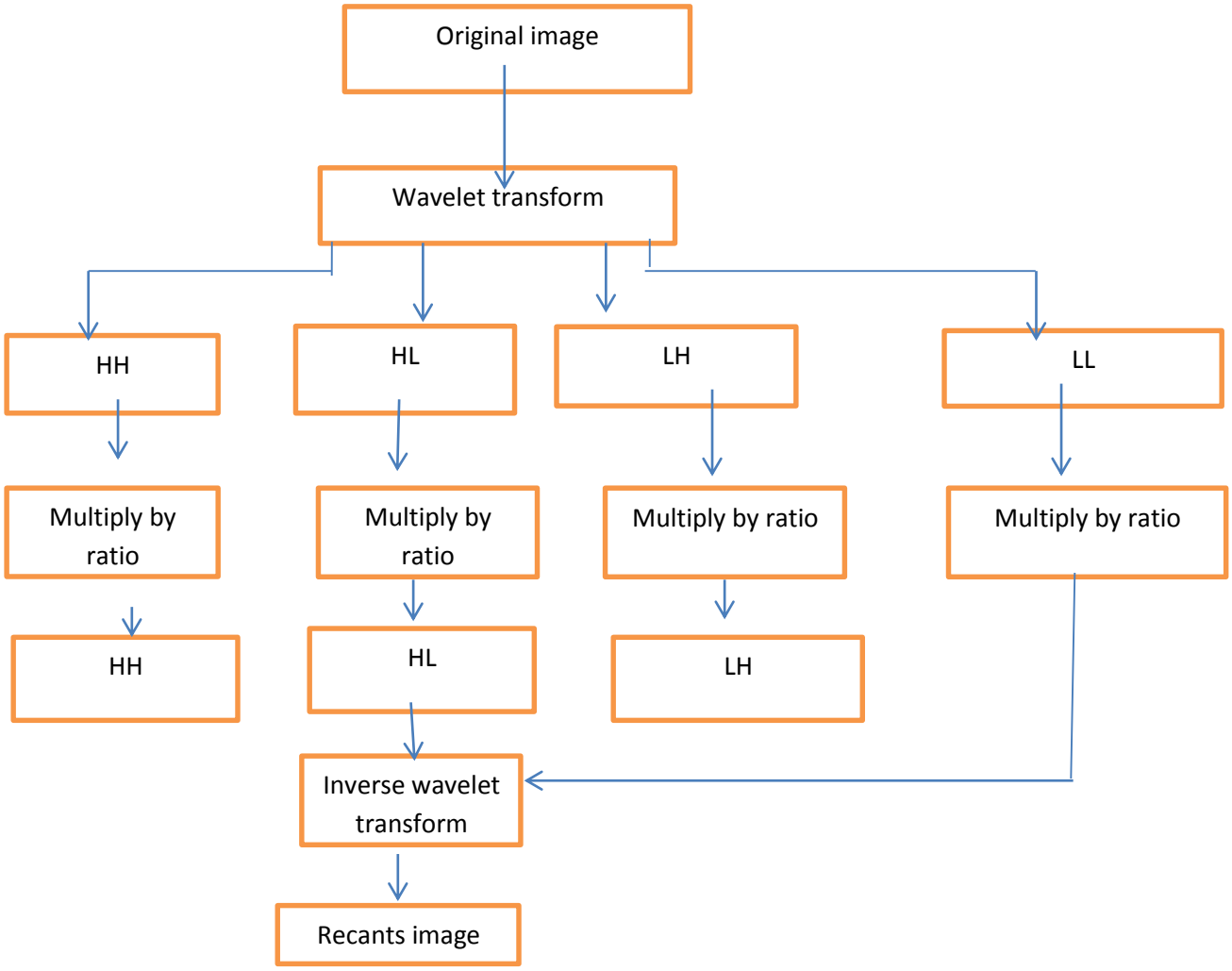



**Figure (3): shows the flowchart to strengthen the edges of the image.[32]**

**Types of wavelet transform:**

1-caller wavelet Transform-C W T.2-Sub-Discrete wavelet Transform-S D W St.
3-Discrete wavelet Transform-D W T.
Wavelet families:
1-Haar wavelet.2-Daubechies wavelet.3-symlets wavelet.4-Coiflets wavelet.
5-Biorthogonal wavelet.6-meyer wavelet.

**Practical part:**

The study samples (images).The table shows the data for the study samples Base (images) that represent the irises. Table (1) shows the database study (pictures) that represent irises of eyes with different Structures.

Different Structures Samples of eyes irises Table (1)

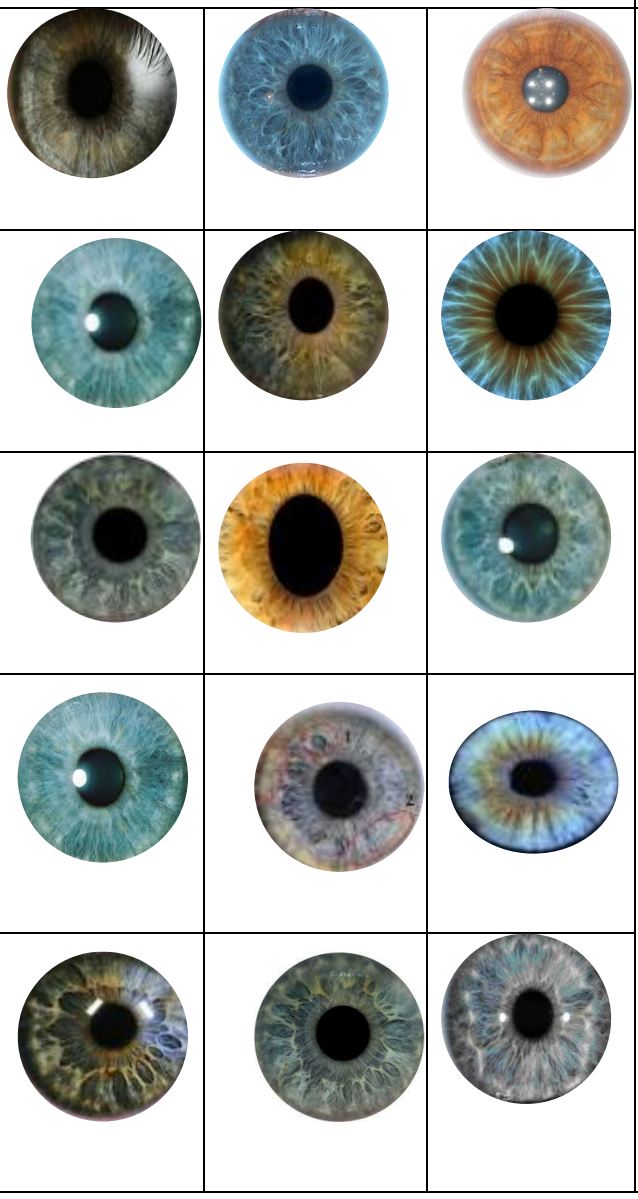
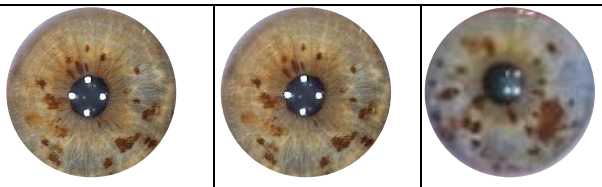
| Structures Iris | Samples | Item TYPE |
|---|---|---|
| Flower |  | JPEG Image |

**Table (2) shows the database study (pictures) that represent irises of eyes with different Structures.**

| Structures Iris | Samples | Item TYPE |
|---|---|---|
| JEWEL |  | JPEG Image |

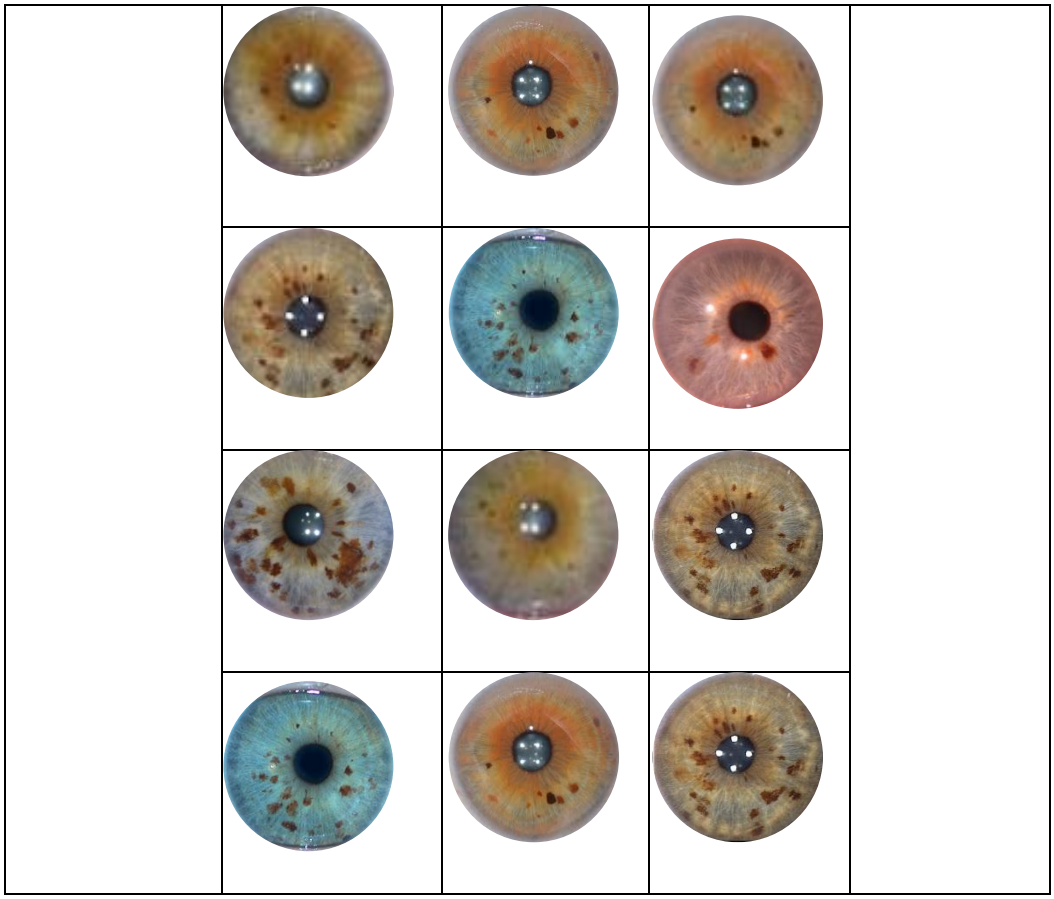
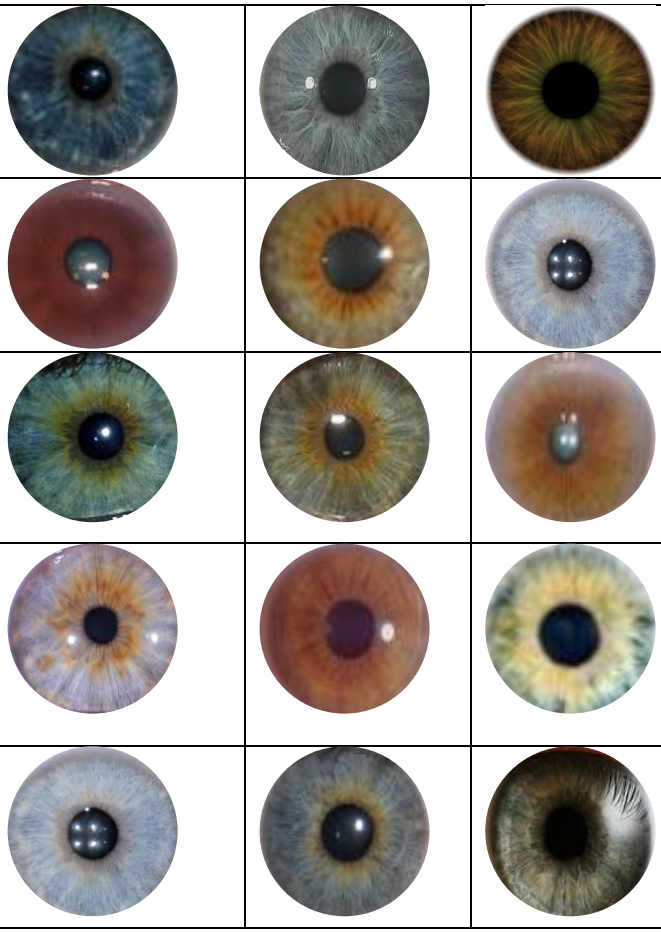


**Table (3) shows the database study (pictures) that represent irises of eyes with different Structures.**

| Structures Iris | Samples | Item TYPE |
|---|---|---|
| Shaker |  | JPEG Image |

**Table (4) shows the database study (pictures) that represent irises of eyes with different Structures.**

| Structures Iris | Samples | Item TYPE |
|---|---|---|
| Stream |  | JPEG Image |

The study was conducted as follows:

-Study of the samples representing different images irises.

-Extract the statistical advantages through the application of statistical operations on them for each type, and compare the results to build a program for rating them.

Image processing techniques, and the algorithm used:

In this paragraph will explain the algorithm that was used to analyze the images and extract features using mat lab program.

1-Take pictures.
2- Primary treatment.
3- statistical operations, extracting a set of special features by statistical operations (such as arithmetic mean, Almira deviation, variance, energy, homogeneity, entropy) which is used for classification of samples.
4. Discrimination using artificial neural networks

-Image processing algorithm transfer wavelet

1- Image capture.
2- Primary treatment.
3- Image processing analysis wavelet.
4-statistical operations, extracting a set of special features, through statistical operations (such as arithmetic mean, standard deviation, variance, energy, homogeneity, entropy) which is used for classification between the study samples.
5- Discrimination using artificial neural networks.

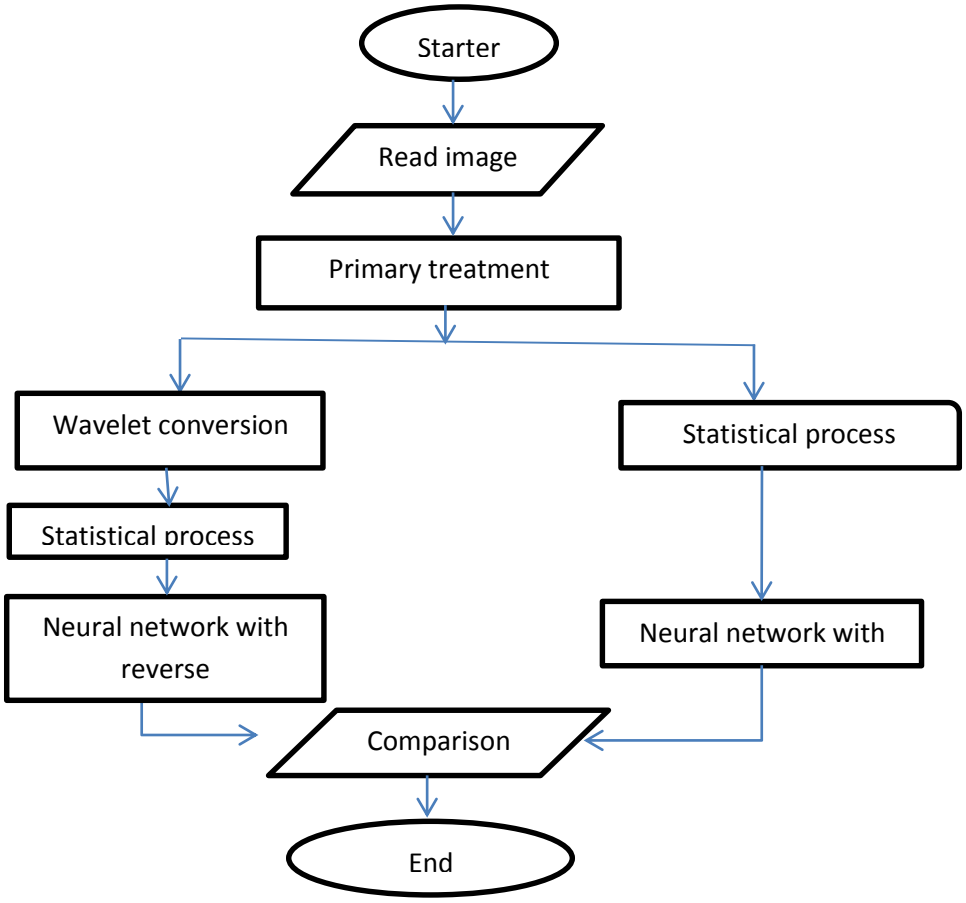



**Figure (4) is a flowchart of the algorithm for neural networks and conversion wavelet.**

Statistical Process adopted in the study.

(6) Was calculated statistical operations for each case of irises, which was adopted in the study, which was adopted as inputs in the same reverse proliferation of neural network

a- Arithmetic mean.

$$\bar{x}=\frac{\sum_{i=1}^{n}\times i}{n} \quad \text{---------- (9)}$$

b- Variance (Var.).

Is the average of the total square deviation values for the middle represents the arithmetic equation?

$$\text{var} = \frac{\sum(x-\bar{x})^2}{n-1} \quad \text{---------- (10)}$$

C- Standard Deviation (S).

It is calculated on the basis that the positive square root of the variance represents the equation.

$$S = \sqrt{var} = \sqrt{\frac{\sum(xi-\bar{x})^2}{n-1}} \quad \text{---------- (11)}$$

D-Energy:

It means how to distribute information (optical intensity) in the image, which usually factor compressibility image represents, and the equation:

$$\text{Energy} = -\sum(f log_2 (f(I,j))) \quad \text{----------(12)}$$

Because that f( I ,j ) means the picture element.

e- Homogeneity:

It is intended image the distribution of elements in the gray image value to their national elements in the picture represents the equation:

$$\text{Homogeneity} = \sum \frac{f(i,j)}{1+|i-j|} \quad \text{---------- (13)}$$

F-Entropy:

Entropy is a statistical measure of the random that can be used to describe the texture of the images and the input is given by.

$$\text{Entropy} = -\sum(f \log2 (f (I, j))) \quad \text{---------- (14)}$$

Artificial neural network algorithms reverse proliferation:

1-Development of artificial neural network, and identify six levels of input, 60 hidden levels and four levels of output.

2-Giving random values for inputs and weights.

3-The use of reverse diffusion method of training and so to modify the weights and values and calculate the value of the critical error.-

4-Repeat until the third step to reach the value of the mist accepted.

5-The use of some well-known results in advance to train the network.

6-Network check to make sure they characterize the specific varieties and figure (5) represents artificial neural network.

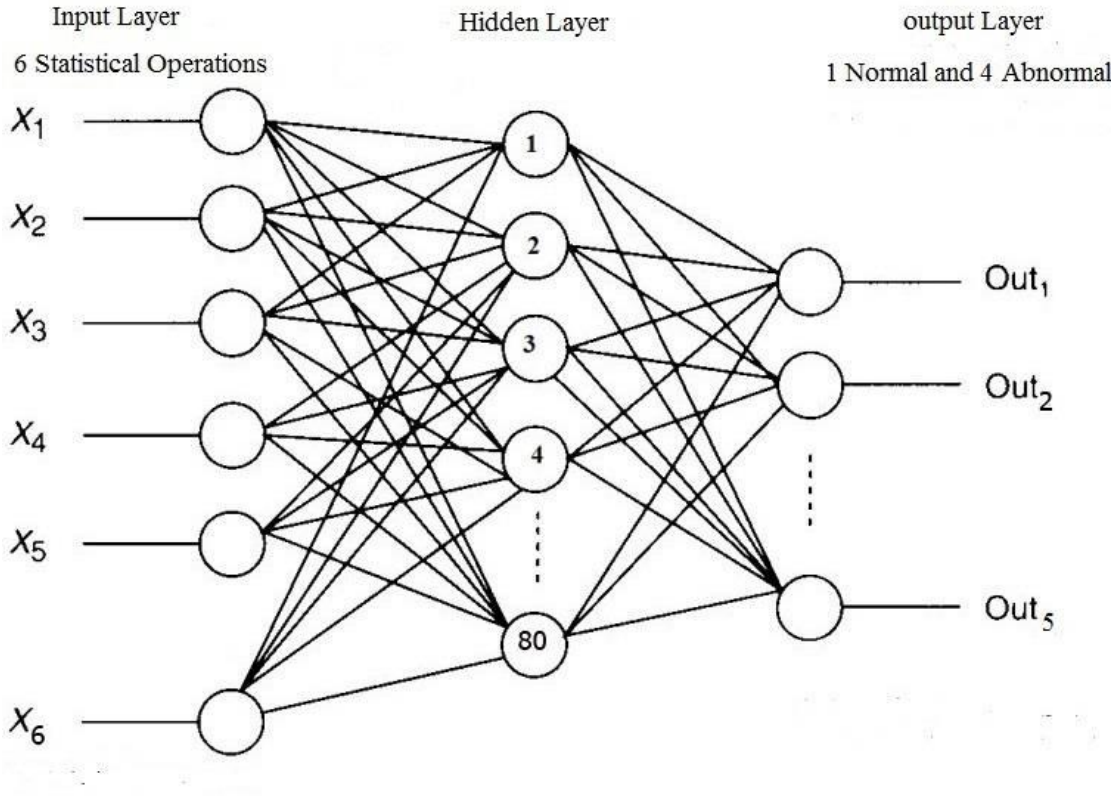



**Figure (5) represents artificial neural network.**

Flowchart for training artificial neural network with reverse proliferation.

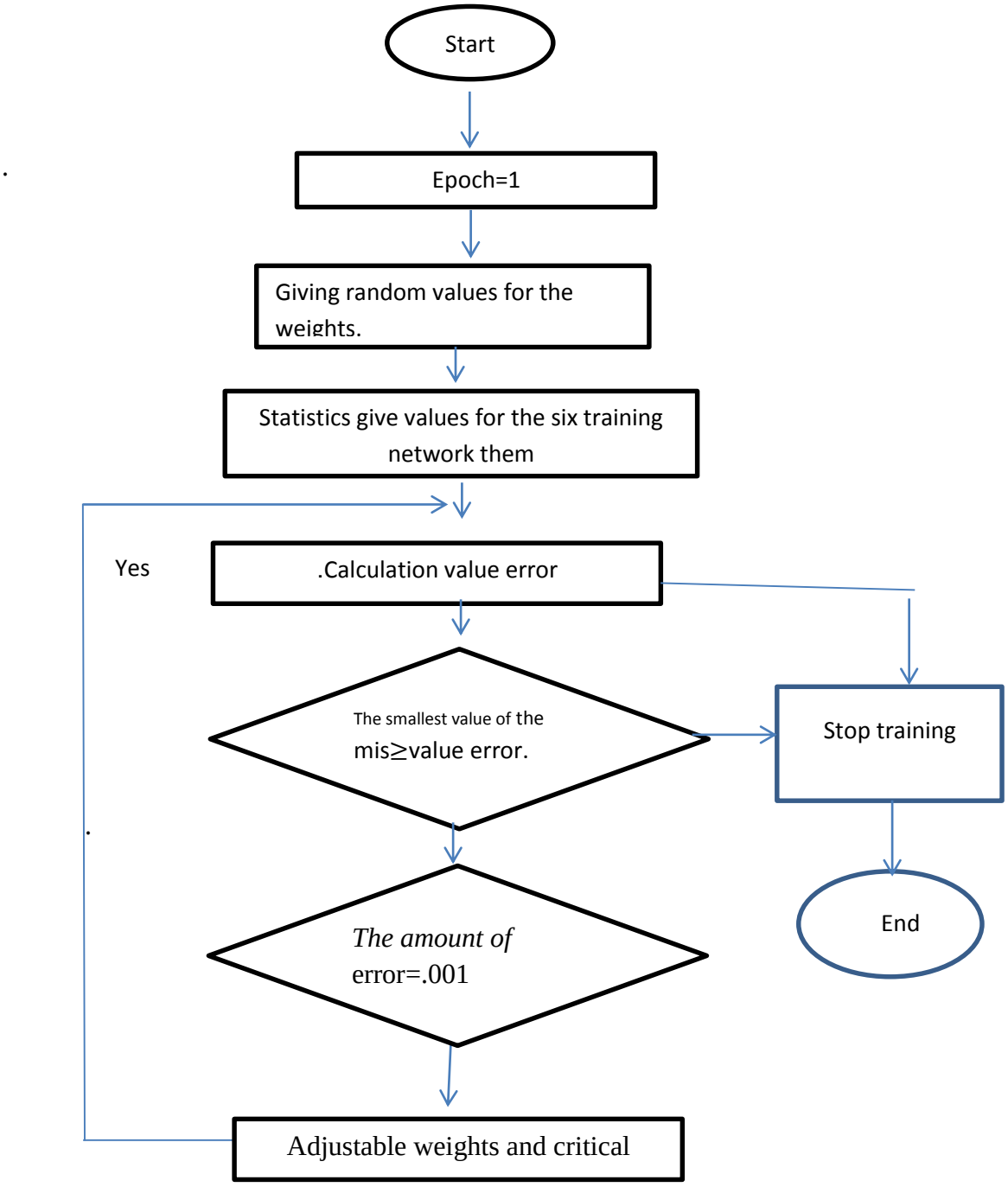



**Fig. (6) Flowchart for training artificial neural network with reverse proliferation.**

Is shown in table (5).

Arithmetic mean homogeneity and entropy. Values, and Aland standard rack, and contrast, energy, and Entropy.

| Samples | FLOWER | | | | | |
|---|---|---|---|---|---|---|
| | Mean | Std. | Var. | Energy | Homogeneity | entropy |
| 1 | 150.3289 | 69.9510 | 4.8931e+003 | 8.0586e-006 | 8.7426e-005 | 7.8403 |
| 2 | 110.3924 | 73.5919 | 5.4158e+003 | 1.4888e-005 | 1.2071 e-004 | 7.8197 |
| 3 | 125.8904 | 50.6087 | 2.5612e+003 | 7.6963e-006 | 9.2150e-005 | 7.5303 |
| 4 | 128.3450 | 53.7612 | 2.8903e+003 | 1.0476e-005 | 1.2125 e-004 | 7.5883 |
| 5 | 162.4495 | 58.8181 | 3.4596e+003 | 1.5421e-006 | 2.6488 e-005 | 7.6230 |
| 6 | 130.1690 | 45.2081 | 2.0438e+003 | 4.6973e-005 | 5.6904 e-004 | 7.4647 |
| 7 | 74.3270 | 38.7805 | 1.5039e+003 | 5.2484e-005 | 4.0277 e-004 | 7.1431 |
| 8 | 94.3242 | 52.3446 | 2.7400e+003 | 8.6121e-006 | 5.9211 e-005 | 7.2430 |
| 9 | 124.1218 | 76.4916 | 5.8510e+003 | 7.0110e-005 | 8.3067 e-004 | 6.5731 |
| 10 | 108.0689 | 76.2604 | 5.8156e+003 | 5.5727e-005 | 7.0193 e-004 | 7.3826 |
| 11 | 134.3197 | 48.2625 | 2.3293e+003 | 5.5348e-005 | 5.7705 e-004 | 7.5210 |
| 12 | 130.1135 | 45.8389 | 2.1012e+003 | 5.5348e-005 | 1.0448 e-004 | 7.4817 |
| 13 | 129.4722 | 52.0064 | 2.7047e+003 | 7.4492e-006 | 5.7070 e-004 | 7.5245 |
| 14 | 124.2453 | 77.5703 | 6.0172e+003 | 9.1939e-006 | 1.3602e-004 | 6.2127 |
| 15 | 77.7439 | 73.4488 | 5.3947e+003 | 9.5006 e-005 | 1.9224 e-004 | 6.7802 |
| Min | 74.3270 | 45.2081 | 1.5039e+003 | 9.1939e-006 | 9.2150e-005 | 6.2127 |
| Max | 162.4495 | 77.5703 | 6.0172e+003 | 9.5006e-005 | 8.3067e-004 | 7.8403 |
| Sum | 1804.312 | 892.943 | 55.721e+003 | 49.7330e-005 | 48.3053 e-004 | 109.7282 |
| Average | 120.2874 | 59.5295 | 3.71476e+003 | 3.3155e-005 | 3.2204e-004 | 7.3152 |

Is shown in table (6).

Arithmetic mean values, and Aland standard rack, and contrast, energy, and homogeneity and entropy Statistical process extracted samples for the study .that represent the Jewels iris and human eye.

| samples | JEWEL | | | | | |
|---|---|---|---|---|---|---|
| | Mean | Std. | Var. | Energy | Homogeneity | Entropy |
| 1 | 126.4083 | 45.5160 | 2.0717e+003 | 7.6342e-006 | 1.2909e-004 | 7.4330 |
| 2 | 136.2700 | 50.5369 | 2.5540e+003 | 4.4296e-005 | 3.4781e-004 | 7.6377 |
| 3 | 131.7364 | 45.1248 | 2.0362e+003 | 1.5835e-005 | 1.5497 e-004 | 7.4186 |
| 4 | 131.7562 | 45.4757 | 2.0680e+003 | 1.0137e-005 | 1.0289 e-004 | 7.4157 |
| 5 | 126.3976 | 44.7153 | 1.9995e+003 | 5.2090 e-005 | 7.3503 e-004 | 7.4038 |
| 6 | 133.9032 | 43.2190 | 1.8679e+003 | 5.2882 e-005 | 6.7220 e-004 | 7.4151 |
| 7 | 148.3647 | 49.7001 | 2.47o1e+003 | 4.3310e-005 | 4.1017 e-004 | 7.5592 |
| 8 | 133.9261 | 43.4846 | 1.8909e+003 | 7.2902 e-006 | 1.1169 e-004 | 7.4294 |

| | | | | | | |
|---|---|---|---|---|---|---|
| 9 | 127.4493 | 49.0714 | 2.4080e+003 | 7.6005 e-005 | 1.3508 e-004 | 7.5266 |
| 10 | 136.7040 | 45.7936 | 2.0971e+003 | 4.3310 e-005 | 4.3053e-004 | 7.4955 |
| 11 | 148.2988 | 50.2127 | 2.5213e+003 | 6.2472 e-008 | 9.1653e-007 | 7.5756 |
| 12 | 145.8919 | 52.8977 | 2.7982e+003 | 1.2277 e-006 | 2.2052e-005 | 7.4541 |
| 13 | 126.4195 | 45.2555 | 2.0481e+003 | 1.1978e-005 | 1.9290e-004 | 7.4240 |
| 14 | 127.2249 | 49.8913 | 2.4891e+003 | 1.8192 e-006 | 3.6509e-005 | 7.5553 |
| 15 | 133.9316 | 43.6994 | 1.9096e+003 | 1.6001 e-006 | 2.7737e-005 | 7.4345 |
| Min | 126.3976 | 43.2190 | 1.8690e+003 | 6.2472 e-008 | 9.1653e-007 | 7.4038 |
| Max | 148.3647 | 52.8977 | 2.7982e+003 | 7.6005e-005 | 6,7220e-004 | 7.6377 |
| Sum | 2014.6825 | 704.594 | 33.2297e+003 | 30.107e-005 | 35.095e-004 | 112.1781 |
| Average | 134.3122 | 46.9729 | 2.2153e+003 | 2.0071e-005 | 2.3397e-004 | 7.47854 |

Is shown in table (7).

Arithmetic mean values, and Aland standard rack, and contrast, and energy, and homogeneity and entropy. Statistical process extracted samples for the study .that represent the shaker iris human eye.

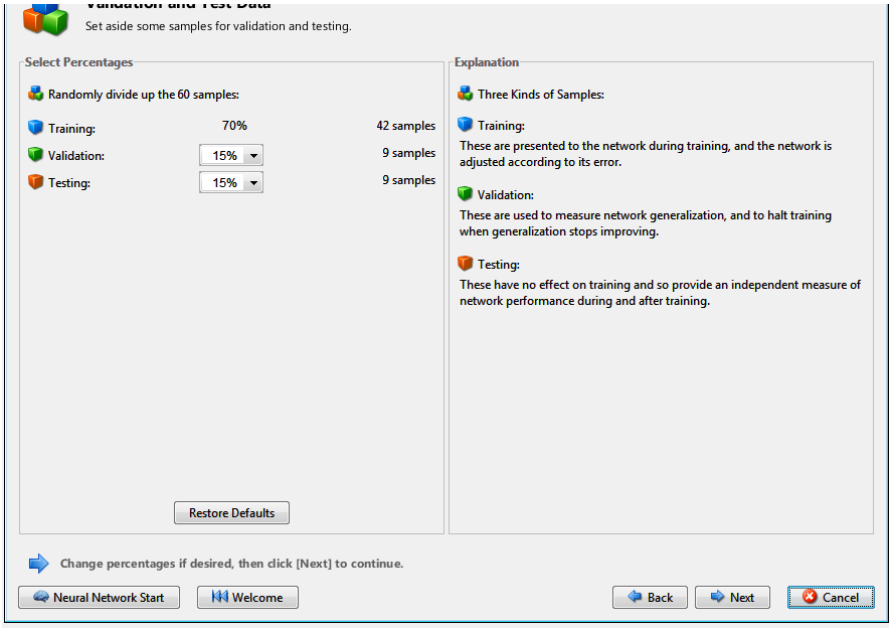
| Samples | SHAKER | | | | | |
|---|---|---|---|---|---|---|
| | Mean | Std. | Var. | Energy | Homogeneity | entropy |
| 1 | 137.0850 | 5050.081 | 2.5081e+003 | 7.1766e-006 | 9.1053e-005 | 6.5615 |
| 2 | 129.2007 | 67.8020 | 4.5971 e+003 | 5.7762 e-006 | 7.5744e-004 | 7.8934 |
| 3 | 162.3330 | 78.7215 | 6.1971e+003 | 8.1710e-006 | 1.1609e-004 | 7.2619 |
| 4 | 139.5017 | 73.9810 | 5.4732 e+003 | 8.4403 e-006 | 1.2452 e-004 | 7.8695 |
| 5 | 140.6631 | 51.6578 | 2.6685 e+003 | 7.5287 e-006 | 6.1771 e-005 | 7.6887 |
| 6 | 128.3589 | 53.3828 | 2.8497 e+003 | 1.6400 e-006 | 1.8053 e-004 | 7.6033 |
| 7 | 134.2338 | 48.8051 | 2.3819 e+003 | 7.4620 e-006 | 9.7197 e-005 | 7.5307 |
| 8 | 105.2996 | 68.3165 | 4.6671e+003 | 9.3881e-006 | 1.0533e-004 | 7.6742 |
| 9 | 119.0441 | 54.7180 | 2.9941 e+003 | 8.0356 e-006 | 8.8314 e-004 | 7.6982 |
| 10 | 136.1125 | 56.2834 | 3.1678 e+003 | 4.0323 e-005 | 3.7449 e-004 | 7.7630 |
| 11 | 125.9189 | 54.9798 | 3.0228e+003 | 6.1247 e-005 | 5.2224 e-004 | 7.7158 |
| 12 | 142.5738 | 62.7211 | 3.9339 e+003 | 4.6477 e-005 | 4.3720 e-004 | 7.7625 |
| 13 | 193.0596 | 45.5741 | 2.0770e+003 | 6.9865e-006 | 9.3340e-005 | 7.2145 |
| 14 | 144.3317 | 57.2270 | 3.2749 e+003 | 9.8402 e-006 | 1.1523 e-005 | 7.6481 |
| 15 | 177.4712 | 49.9349 | 2.2029 e+003 | 1.4829 e-006 | 2.5167 e-005 | 7.4502 |
| Min | 105.2996 | 45.5741 | 2.0770e+003 | 9.8402 e-006 | 9.7197e-005 | 6.5615 |
| Max | 193.0596 | 78.7215 | 6.1971e+003 | 6.1247e-005 | 8.8314e-004 | 7.8934 |
| Sum | 2151.1876 | 874.1861 | 52.0161e+003 | 29.6721e-005 | 39.8474e-004 | 113.5241 |
| Average | 143.41251 | 58.2791 | 3.4677e+003 | 1.9782e-005 | 2.6565e-004 | 7.5683 |

Is shown in table (8).

Arithmetic mean values, and Aland standard rack, and contrast, and energy, and homogeneity and entropy. Statistical process extracted samples for the study .that represent the stream iris human eye.

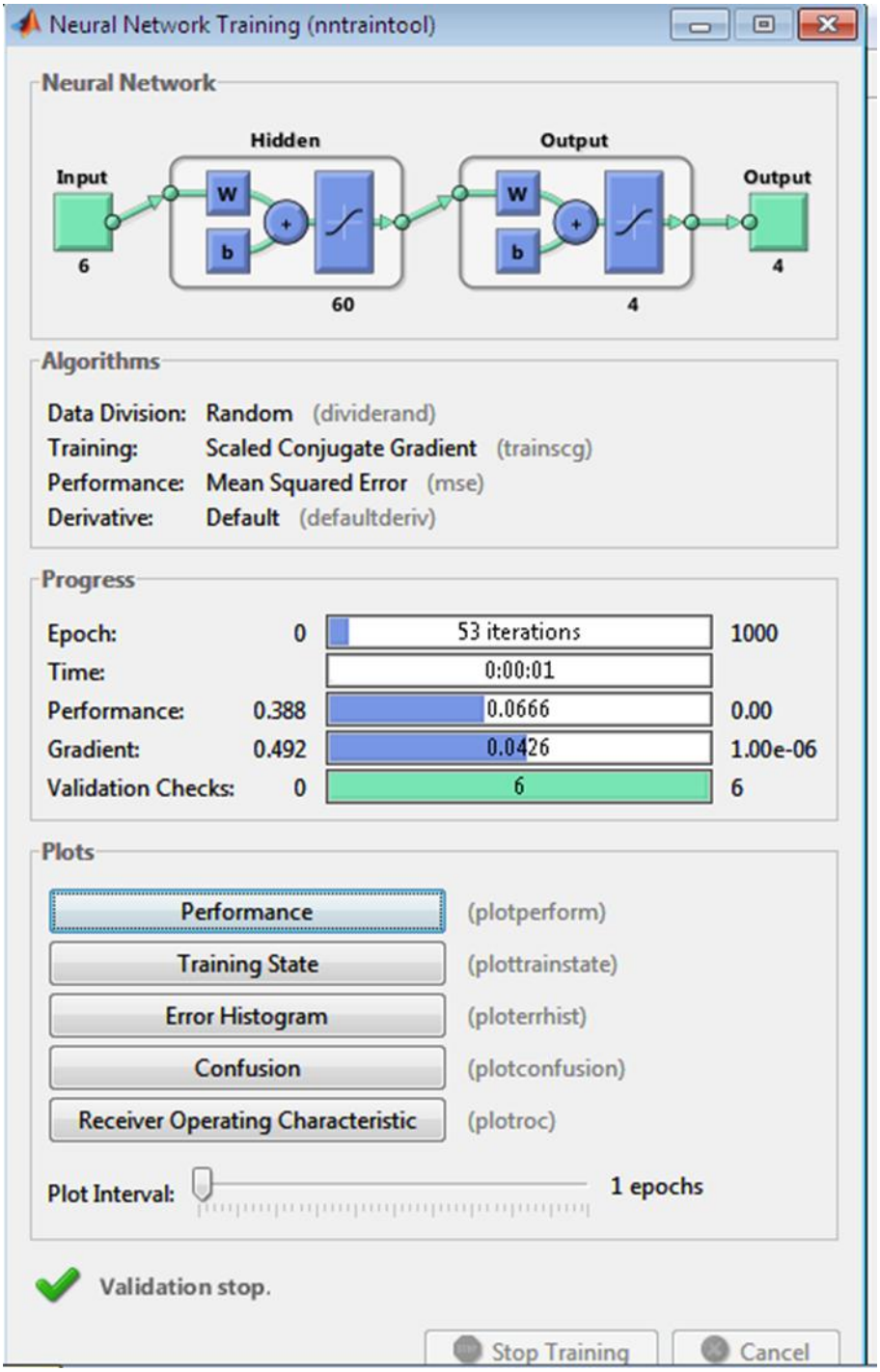
| Samples | Stream | | | | | |
|---|---|---|---|---|---|---|
| | Mean | Std. | Var. | Energy | Homogeneity | Entropy |
| 1 | 110.3924 | 73.5919 | 5.4158e+003 | 1.4888e-005 | 1.2071e-004 | 7.8197 |
| 2 | 137.7269 | 61.7318 | 3.8108 e+003 | 7.9543 e-006 | 7.7347 e-005 | 7.7725 |
| 3 | 92.6214 | 53.3207 | 2.8431 e+003 | 3.2160 e-005 | 3.1216 e-004 | 7.6110 |
| 4 | 96.8345 | 38.3567 | 1.4712 e+003 | 3.1200 e-005 | 4.6588 e-004 | 7.2240 |
| 5 | 115.7673 | 58.6506 | 3.4399 e+003 | 8.6547 e-006 | 9.2398 e-005 | 7.8261 |
| 6 | 166.5554 | 43.6421 | 1.9046 e+003 | 7.0805 e-006 | 1.0085 e-004 | 7.2538 |
| 7 | 101.3951 | 93.0351 | 8.6555e+003 | 1.2128e-005 | 1.6695e-004 | 6.3725 |
| 8 | 130.7664 | 53.8840 | 2.8717 e+003 | 7.7332 e-005 | 7.9978 e-004 | 7.6989 |
| 9 | 113.6496 | 43.4089 | 1.8843e+003 | 7.5576e-006 | 1.o454e-004 | 7.3704 |
| 10 | 120.2089 | 53.7930 | 2.8937 e+003 | 4.6739 e-005 | 3.5874 e-004 | 7.6429 |
| 11 | 184.7444 | 63.0233 | 3.9719 e+003 | 5.8144 e-005 | 6.7173 e-004 | 7.0479 |
| 12 | 120.5192 | 50.0606 | 2.5061 e+003 | 3.7872 e-005 | 3.6729 e-004 | 7.5238 |
| 13 | 173.0850 | 50.0814 | 2.5081 e+003 | 3.1766 e-006 | 9.1053 e-004 | 7.4506 |
| 14 | 143.5960 | 50.2755 | 2.5276 e+003 | 4.3714 e-005 | 4.8498 e-004 | 7.5935 |
| 15 | 166.5622 | 43.7453 | 1.9136 e+003 | 1.5526 e-006 | 2.5181 e-005 | 7.2621 |
| Min | 92.6214 | 38.3567 | 1.4712 e+003 | 8.6547 e-006 | 9.2398 e-005 | 7.0479 |
| Max | 184.7444 | 93.0351 | 8.6555e+003 | 7.7332-005 | 9.1053e-004 | 7.8261 |
| Average | 131.6283 | 55.3734 | 2.9079e+003 | 2.2949e-005 | 2.8264e-004 | 7.4313 |

It was taken 70% of these samples to train the network, and 15% to verify the validity of raining, and 15% to taste, the network as show in figure (7).




**The figure (7): selection of training –ratios and validation and Testing**

The figure (8): represent training operation to the artificial neural




**Show in fig. (9) The efficiency of artificial neural network classification of samples to (60) sample, it was 100%.**


**The fig. (9) Represent the final artificial neural network for the state of training results.**

Noting the shape of Bane show us, four groups show the training results, And validation, Test and the final product (All matrixes) and each group (Blocks) ,Consists of 36 square and 20 red Box represents the error, and 5 green Boxes indicate output right, 10 Black Boxes indicate the proportions of correct results (green) .The proportion of the wrong red results in each case, and on box Blue indicates the percentage of correct samples in the latter figure are the result of the final training .it was 100% in the classification of each case and the error was 0%.

**The table (9) results of the accuracy of the four cases that have been market with artificial neural networks reverse spread by wavelet.**

| Cases | Results accuracy convertible wavelet (Artificial neural network with reverse deployment training). |
|---|---|
| 1 | 76.7% |
| 2 | 75% |
| 3 | 75% |
| 4 | 76.7% |

Table (9) Comparing the results shows the accuracy of excellence between primary treatment and conversion wavelet networks

Artificial Neural with reverse proliferation.

**Table (10) Compare the results of accuracy for distinguishing between primary treatment and conversion wavelet.**

| Case | Preliminary results of the precision of the treatment of the samples father of rissah. (Artificial neural network with reverse deployment training). |
|---|---|
| 1 | 71.7% |
| 2 | 100% |
| 3 | 73.3% |
| 4 | 75% |
| 5 | 70% |

Note from the tables above that the distinction between types of irises have increased accuracy in artificial neural networks after image processing conversion wavelet as wavelet conversion work to strengthen the characteristics of the image.

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