From Image to Neutrosophic Image

Presented By

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UNDER SUPERVISION OF

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Second International Conference

Faculty of Nursing / Port -Said University

Nursing Between Reality and Hoped

(A future vision)

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Under the Patronage

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Conference Objectives:

1- Reflect the reality of the nursing services quality and health care.
2- Monitor the negative aspects of nursing care scope, from the perspective of different groups.
3- Determine the gap between the theoretical and practical aspects of nursing.
4- Suggest multiple future visions for nursing sciences development to gain access to quality and excellence.

Conference Axes:

1- Nursing scientific research and neutrosophic logic
2- Systems of practical and theoretical evaluation of nursing students.
3- Scientific methods used to measure the quality of nursing services.
4- The reality of the theoretical and practical aspects of applied nursing.
5- Job description of the nurse between reality and expected.
6- Developmental Nursing Strategies and Programs.
7- Quality and performance excellence.

CONFERENCE FEES

	Egyptians	Non-Egyptians
Attendance	L.E200	$200
Talk / Poster	L.E300	$300
Research	L.E500	$500

Conference Contact

Abstracts should be sent at the following e- mail address:

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In recent years, the growth of computer technology, using multimedia data in various fields such as remote sensing, medical and online information services the massive volume of electronic data a large part of which is in the form of images. Thus the need for efficient and automated search tools to index and retrieve information from these visual databases is necessary.

The image as mathematical object

- An image is mathematically represented by an $m\times n$ matrix
- $I=[g_{ij}]_{m\times n}$
- With entities g(i, j) corresponding to the intensity to the given pixel located at the node (i , j)

The image in the Neutrosophic Domain

In the ND each pixel of the image is represented by three values

$$P_{ij}=\{T_{ij}, I_{ij}, F_{ij}\}$$

$$T(i\,,j)=\frac{\bar{g}(i,j)-\overline{g_{min}}}{\overline{g_{max}}-\overline{g_{min}}}$$

$$I(i\,,j)=\frac{\delta(i,j)-\delta_{min}}{\delta_{max}-\delta_{min}}$$

$$F(i\,,j)=\frac{\overline{g_{max}}-\bar{g}(i,j)}{\overline{g_{max}}-\overline{g_{min}}}$$

The image in the ND

When $\bar{g}(i,j)$ is the mean intensity in some neighborhood w of the pixel

$$\bar{g}(i,j)=\frac{1}{w\times w}\sum_{m=i-\frac{w}{2}}^{m=i+\frac{w}{2}}\sum_{n=j-\frac{w}{2}}^{n=j+\frac{w}{2}} g(m,n)$$

And

$\delta(i,j)$=abs (g(i, j) - $\bar{g}(i,j)$)

Hence in the Neutrosophic Domain the image becomes A 3D matrix

$$I_{ND} = [T_{ij} \quad I_{ij} \quad F_{ij}]$$

, With dimension(mxnx3)

DIMENSION REDUCTION

In real crisp domain, there are several techniques to reduce the dimension of the desired object(image)

MDS	multidimensional scaling
PCA	principle component analysis
LLE	locally linear embedding
ISOMAP	isometric feature mapping

DIMENSION REDUCTION

The main idea is to use a distance matrix that computes the dissimilarity (similarity)

between the objects (images),

To embed these objects into a subspace of lower dimension

HAUSSDORFF DISTANCE BETWEEN TWO NEUTROSOPHIC SETS

For A,B two neutrosophic sets of the universe X

d_H(A,B)=

$\max_i\{|T_A(x_i) - T_B(x_i)|, |I_A(x_i) - I_B(x_i)|, |F_A(x_i) - F_B(x_i)|\}$

This distance operator satisfies the following axioms

d_H(A,B)>=0

d_H(A,B)=0 if and only if A=B

d_H (A,B)=d_H(B,A)

IF A≤B≤C , A,B,C neutrosophic sets (NS) ,then
d_H (A,C)≥ d_H (A,B) and d_H (A,C)≥ d_H (B,C)

MULTIDIMENSIONAL SCALING MDS

We are using this method to embed the data specified in the dissimilarity matrix (Haussdorff distance matrix H)

Into a manifold ,which is a topological space that resembles Euclidean space near the points

Here the objects are represented as points in a low dimensional space, such that the distances between the points match the observed dissimilarity as closely as possible

THE MDS TECHNIQUE

THE STARTING POINT IS TO COMPUTE A NEW MATRIX T,WHOSE ELEMENTS

$$T_{rc} = -\frac{1}{2}\left[{H_{rc}}^2 - {H_{r.}}^2 - {\widehat{H}_{.C}}^2 - {\widehat{H}_{.o}}^2\right]$$

Where $H_{r.}$ is the average value over the r_th row in the distance matrix H

$\widehat{H}_{.C}$ is the average value over the c_th row the distance matrix H

$\widehat{H}_{.o}$ is the average value over all the rows& columns of H.

THE MDS TECHNIQUE

The next step is to perform a spectral Decomposition on T to get

$T=\varphi \Lambda \varphi^T$

Where Λ is a diagonal matrix with the eigen values of T as the elements of its diagonal and φ is the matrix which its columns are the corresponding eigen vectors

THE MDS TECHNIQUE

Finally, the young-householder decomposition is performed on T to find a coordinates matrix X , that is T= X^T X

Hence , x= $\sqrt{\Lambda}\ \varphi^T$

where the columns of X is the coordinates vector of each point in the low dimensional space .