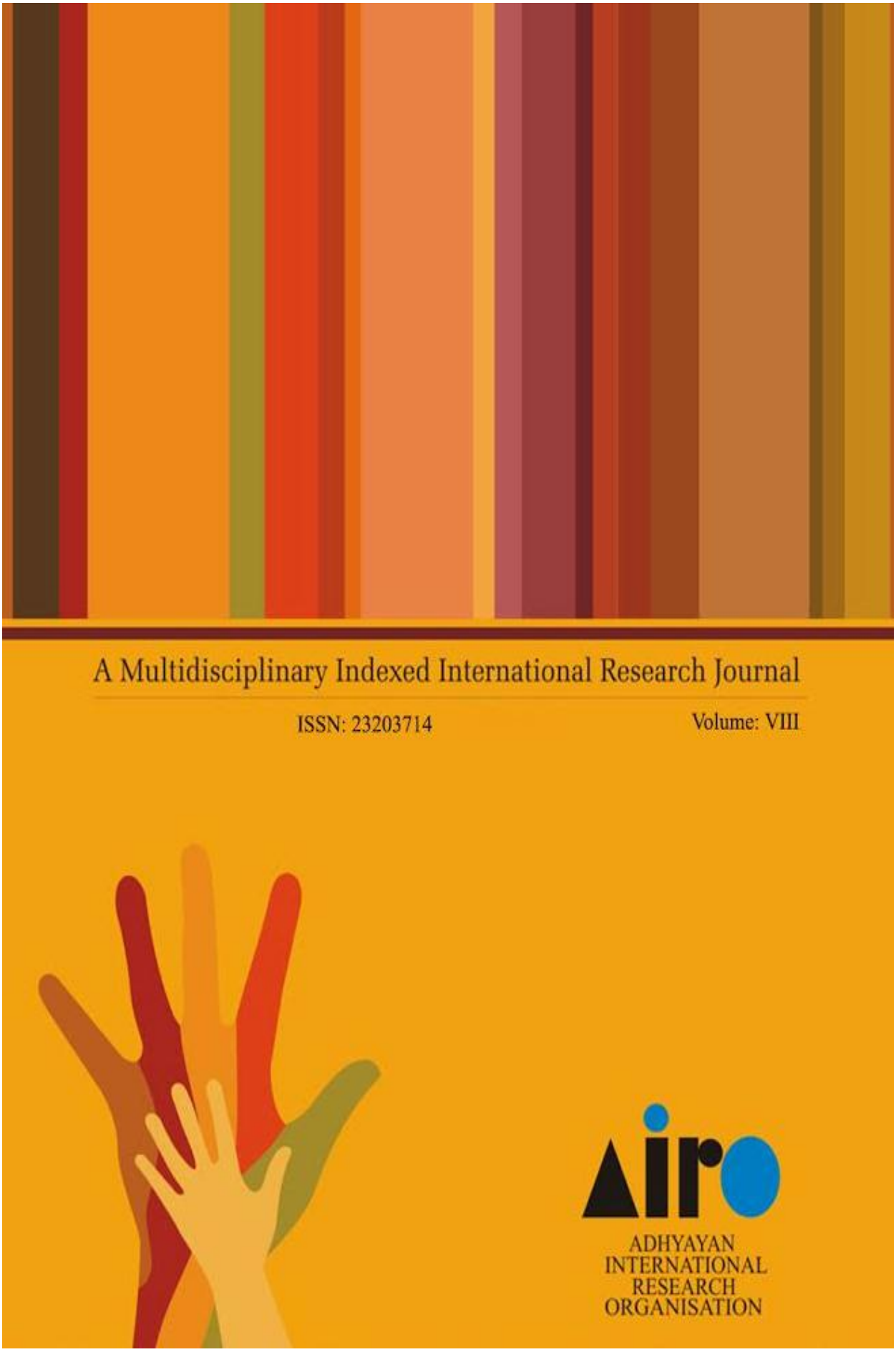
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IMPLEMENTATION RESULTS OF IMAGE RETRIEVAL BASED ON OBJECTS FEATURES IN AN IMAGE

Sumeet Kumar
Research Scholar
Dept. Computer Science
NIILM University, Kaithal
ksumeet2012@yahoo.com

Dr. Gagan Marken
Assistant Professor
Dept. Computer Science & Engg.
NIILM University, Kaithal
gagimarken@gmail.com

Abstract: - *Searching of an image on the basis of its contents (features) instead of any keyword is called content based retrieval. Here an image is identified from the huge collection of images. To search an image form smaller no of images is very easy task even a human being can do this very easily. But in some situation it becomes a hectic task when a image to be searched from lakh's of images of a database. So to oversome this problem architecture is proposed here. First strong points from two grey scale images are identified. Then on the basic of these extracted points from the two images one from the input (query image) and second from the database are compared to check maximum numbers of similarity of the points. The image that has higher number of match points will be the result image and will be called first_nearby_image and I have also shown the second nearby image.*

1. INTRODUCTION

Searching of an image from the huge database of different images is very big task and is called retrieval. There are many methods of retrieval. Here the images can be retrieved on the basis of local and global features derived from color, texture, and simple shape information. The actual work is here is to take a query image first or it can be called an input image. Then next step is to identified and extract the important features from the image which will help in the process of retrieval image from the database. Some CBIR system retrieved images on low-level features such as texture and color of an image [1]. The basic strategy of this proposed work of retrieval of an image is shown in figure 1. Main work is to retrieve the image.

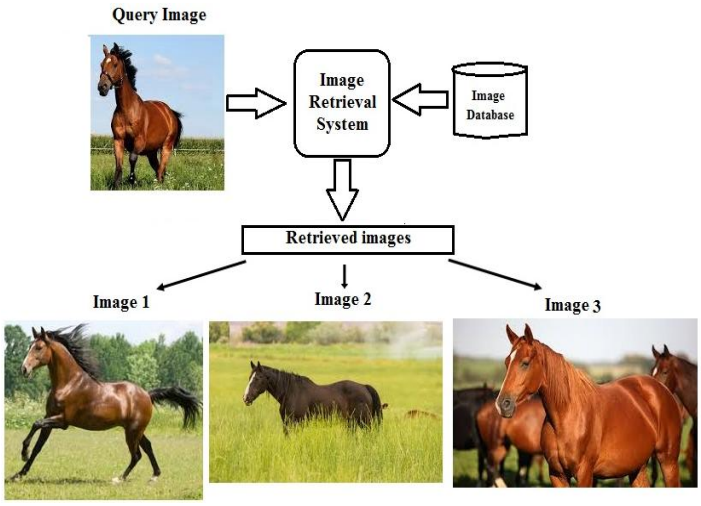

Figure1: Image Retrieve search picture as picture

2. LITERATURE SURVEY

Robert S. Gray et al. [2] researcher has introduced a simple content-based system that retrieves color images on the basis of their color distributions and edge characteristics. The system uses two retrieval techniques that have been described in the literature. The performance of the system is evaluated and various extensions to the existing techniques are proposed. Jon R. Smith et al. [3] presents a binary color set back-projection technique and discuss its implementation in the Visual SEEK content-based image/video retrieval system for the World Wide Web. We also evaluate the retrieval effectiveness of the color set back-projection method and compare its performance to other color image retrieval methods. Xiuqi Li et al. [4] proposed a unique unsupervised segmentation algorithm combined with the wavelet technique generates the spatial feature of an image automatically. The resulting feature vectors are relatively low in dimensions compared to those in other systems. As a result, queue processing is speeded up. The experimental results demonstrate that our system is capable of retrieving images that belong to the same category. Ritendra Datta et al. [5] herein this paper, we discuss some of the key contributions in the current decade related to image retrieval and automated image annotation, spanning 120 references. We also discuss some of the key challenges involved in the adaptation of existing image retrieval techniques to build useful systems that can handle real-world data. Amit Jain et al. [6] this paper presents an algorithm for retrieving images with respect to a database consisting of engineering/computer-aided design (CAD) models. The algorithm uses the shape information in an image along with its 3D information. A linear approximation procedure that can capture the depth information using the idea of shape from shading has been used. Swati V. Sakhare et al. [7] in this paper we propose a novel method with highly accurate and retrieval efficient approach which will work on large image database with varied contents and background. Suman Lata et al. [8] this research presents a review on various ways of content based image retrieval. the author has discussed the fundamental aspects, visual features and techniques for fast searching and retrieval of images from the database. The use of wavelets in CBIR is also discussed.

3. PROBLEM FORMULATION

We know that image retrieval is not an easy task, because the images are in digital form and with various object (river/sunset/buildings) and it is not easy to search the image on the basis of other image. Even human can do this task vary easily we can see and sense what we have seen so we can manage it, but what will do if we have a huge amount of images in a database. It may be very exhaustive process. So we need an algorithm which can help us to do this task for the human being and the answer is image retrieval on the basis of its internal objects features. To solve this problem I am trying to design architecture for retrieval of image.

4. OBJECTIVES

The basic objective of this research is to retrieval of the image from the database similar to the input query image. The objectives are:

- Design architecture for object's feature extraction and retrieval of a gray scale image.
- Implementation using Matlab (image processing tool box).
- Graphically presentation and comparison of the extracted and matched features of the images.
- Calculate and analyze the results MSE and PSNR value.

5. METHODOLOGY

- **Corner Matrix and Corner Detector**

The Corner Detector object of vision package finds corners in a grayscale image. It returns corner locations as a matrix of [x y] coordinates. The object finds corners in an image using the Harris corner detection minimum Eigen value or local intensity comparison method [9].

H = vision.CornerDetector

Returns a corner detector object, H, that finds corners in an image based on pixels with the largest corner metric values.

H = vision.CornerDetector(Name,Value)

Returns a corner detector object, H, with each property set to the specified value. You can specify additional name-value pair arguments in any order as (Name1, Value1,...,Name N, Value N

- **Extract Features method**

[FEATURES,VALID_POINTS] = extractFeatures(I,POINTS)

[FEATURES,VALID_POINTS] = extractFeatures(I,POINTS,Name,Value)

[INDEX_PAIRS,M_MET] = matchFeatures(FEATURES1,FEATURES2,Name,Value)

PARAMETERS

- **PSNR (Peak Signal to Noise Ratio)**

Compute signal to noise ratio in decibles between images. This ratio is often used as a quality measurement between the original and a compressed image. The higher the PSNR, the better the quality of the compressed or reconstructed image. It is the ratio between the maximum possible power of a signal and the power of corrupting noise that affects the fidelity of its representation. The PSNR of the fusion result is defined as follows:

$$\text{PSNR} = 10\log_{10}\left(\frac{R^2}{MSE}\right)$$

R= 1 (if if the input image has a double-precision floating-point data type)

R=255 (If it has an 8-bit unsigned integer data type)

- **RMSE**

Our basic measure of how closely a model fits some data is the Root Mean Squared Error (RMSE), which measures the average mismatch between each data point and the model. This is why you should look at the RMSE values as your first tool to inspect the quality of the fit — high RMSE values can indicate problems. When two-stage modeling, use the RMSE Explorer to quickly investigate the local models with highest RMSE [9].

The smaller the RMSE, the closer our model follows the data;

A commonly used reference based assessment metric is the Root Mean Square Error (RMSE). The MSE between a reference image, $I_1$and I_2 image is given by the Following equation:

$$\text{RMSE} = \frac{1}{MN}\sum_{m=1}^{M}\sum_{n=1}^{N}\left(I_1(m,n) - I_2(m,n)\right)^2$$

Where I_1 (m, n) and I_2 (m, n) are the reference of two images respectively, and M and N are image dimensions. Smaller the value of the RMSE, better the performance of the fusion algorithm.

6. IMPLEMENTATION

To implement this or to achieve our target MATLAB 12.0 is used. In this software we have used image processing toolbox which helped us to achieve the target. First of all an architecture/layout is prepared in the matlab as shown in the next figure. Then we will move forward towards target. Let us see the main layout and the snapshots of the implementation of this research work. The entire activities of this proposed architecture is divided into three modules as described in next figure.

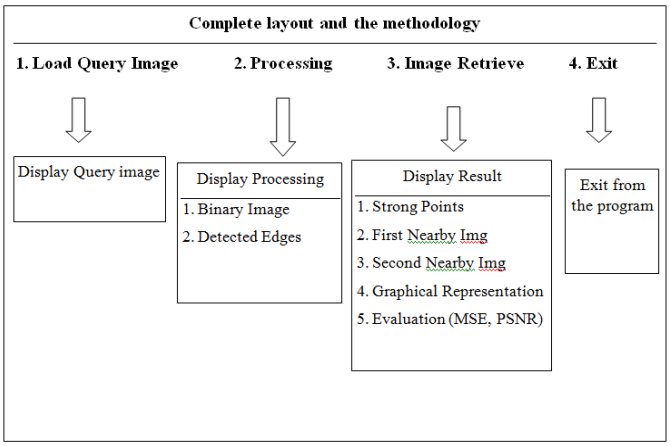

Figure 2: Layout plan of proposed work

- **Working**

Here I am presenting the implementation results of my proposed research work. To implement the proposed architecture I have designed an image retrieval based on the objects features in a grey scale image and layout is designed using Matlab 12.0. First an input is required which is called a query image. This image will be loaded then processed and then the retrieval will be started, this will be matched with the entire images on in our database. Next figure is showing the main layout of the proposed work.

Figure 3: the main layout of the proposed work

Module 1: Load query image

To load the query image a user has to click on load_Query_Image button from the control box as shown in above figure. As the user will click on this button than an open file box will be appeared on the screen now the user has to open query image folder and then he has to select query image.

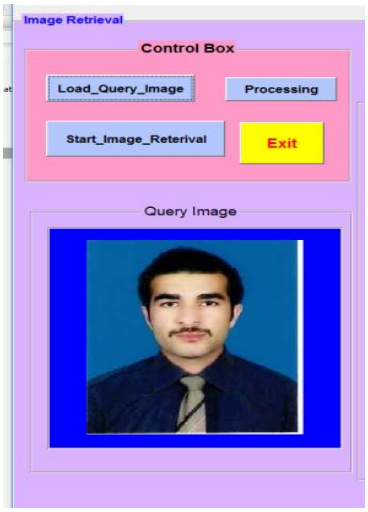

Figure 4: Loaded query image.

Module 2: Processing

If user has loaded the input query image for retrieval, the next step is to start the processing. Here the input query image will be converted in black and white (binary) image, because binary image can be easily understand by computer as shown in next figure .

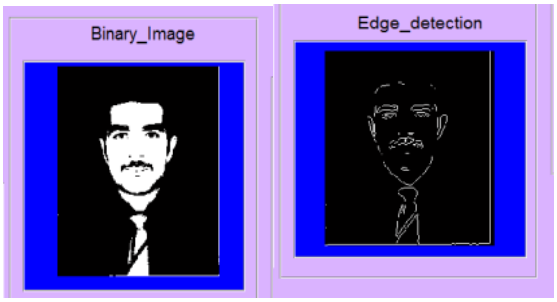

Figure 5: Binary image and Edges of Query image

Module 3: Start_Image_Retrieval

After loaded the query image next work is to compare the input image with the database images. First of all the points from the input image and the first image from the database are detected for matching purpose. After detecting the matching points features are extracted and matched with the next image. The same process is repeated with all the images stored in the database. To store the matched features for all the comparison pairs a variable is taken "*F*". ***N***ext figure is showing the corresponding selecting points. On the basis of matched features, an image will be selected and displayed as most nearby image.

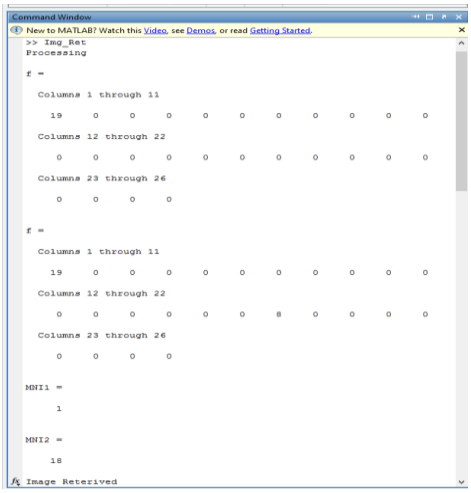

Figure 6: Running of Code in command window.

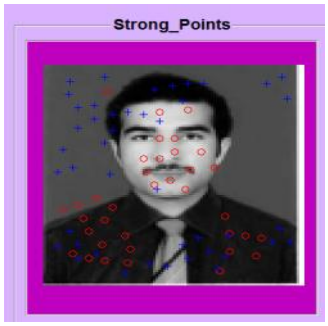

Figure 7: Selected points from images

7. Results

When we have done everything i.e. from loading of the query image to the retrieval then we have to check the result of this process. Next figure 8 is showing us the complete process form the query to the searching and finally the results image.

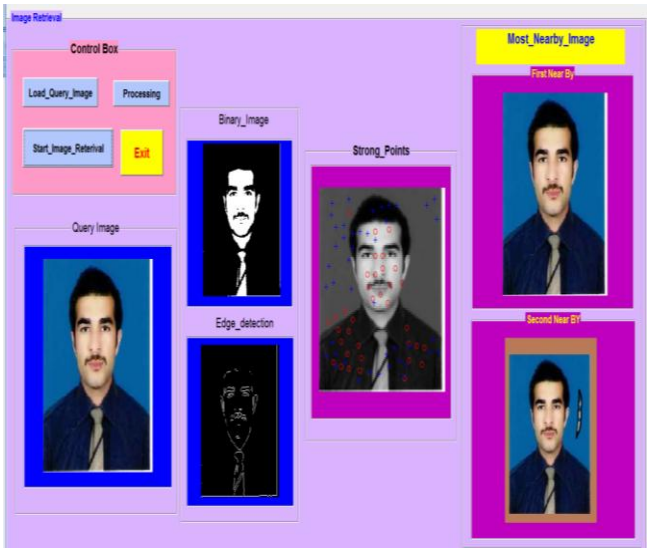

Figure 8: final result two Retrieved Images (First_nearby and Second_Nearby images).

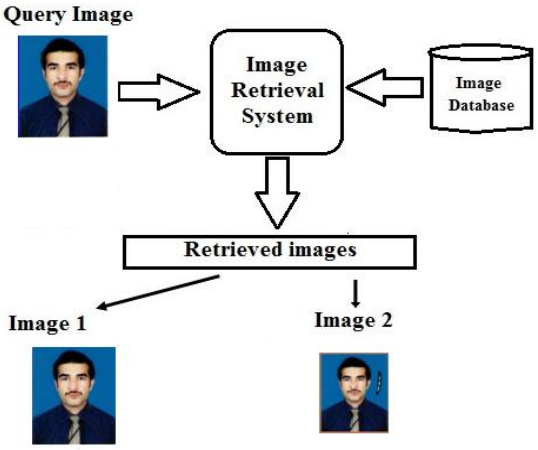

Figure 9: complete process and result (Two Retrieved Images).

- **Graphical Representation**

Next figure is showing the graphically results of all the matched features of all the database images. The image which has the higher number of matched pixel will be selected and displayed. In the last the performance of the result is evaluate on the basis of MSE and PSNR values. The results are calculated and displayed in the figure 11.

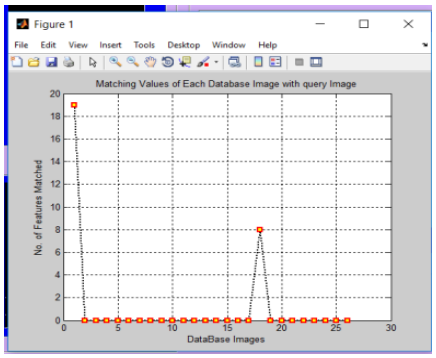

Figure 10: Graphical representation of matched features.

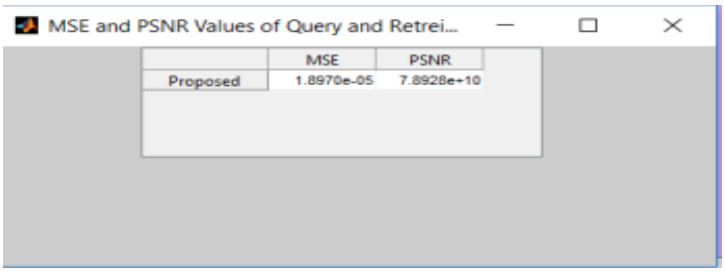

Figure 11: Showing the MSE and PSNR values

8. CONCLUSION

As the results of this proposed work are shown in the above figure and we found that we have achieved our all the objectives. Result is also shown in the graphical representation and in the last section we have shown the evaluation and the performance of the proposed research work on the basis of MSE and PSNR value.

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