Image reconstruction using Content Based Image Retrieval

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Abstract— *The paper presented here contains a method of reconstructing a damaged image. This image is damaged as it has patches and to get the complete and clear image this patch is removed from that image. But to remove that patch the same image which is not damaged should be present in a database. This database may contains a large number of images in it to find the most similar image and reconstruct this patch several techniques are summed with the CBIR method. The results achieved in this whole process are 97.71% accurate. This accuracy is checked by the intensity values of the signals form images.*

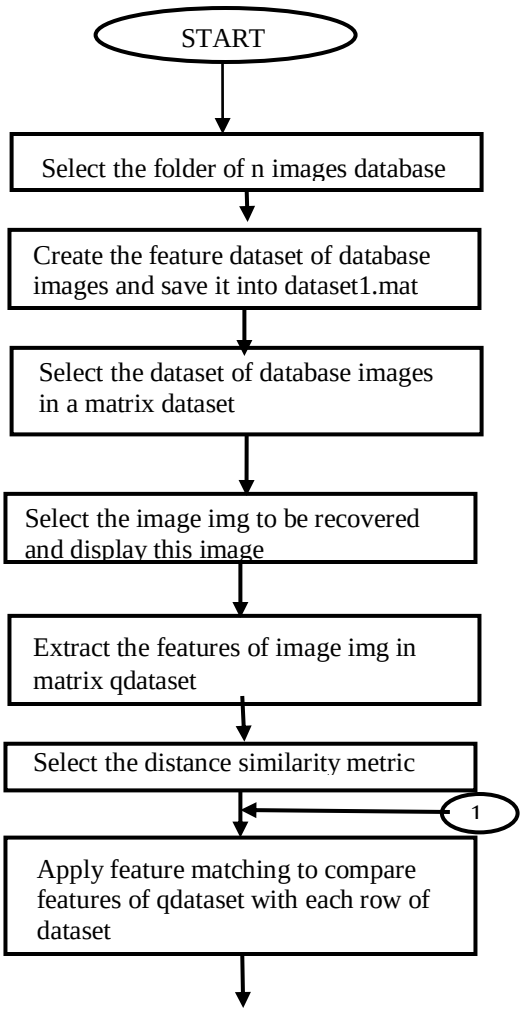
Keywords—*CBIR, Pixilation, Filteration.*

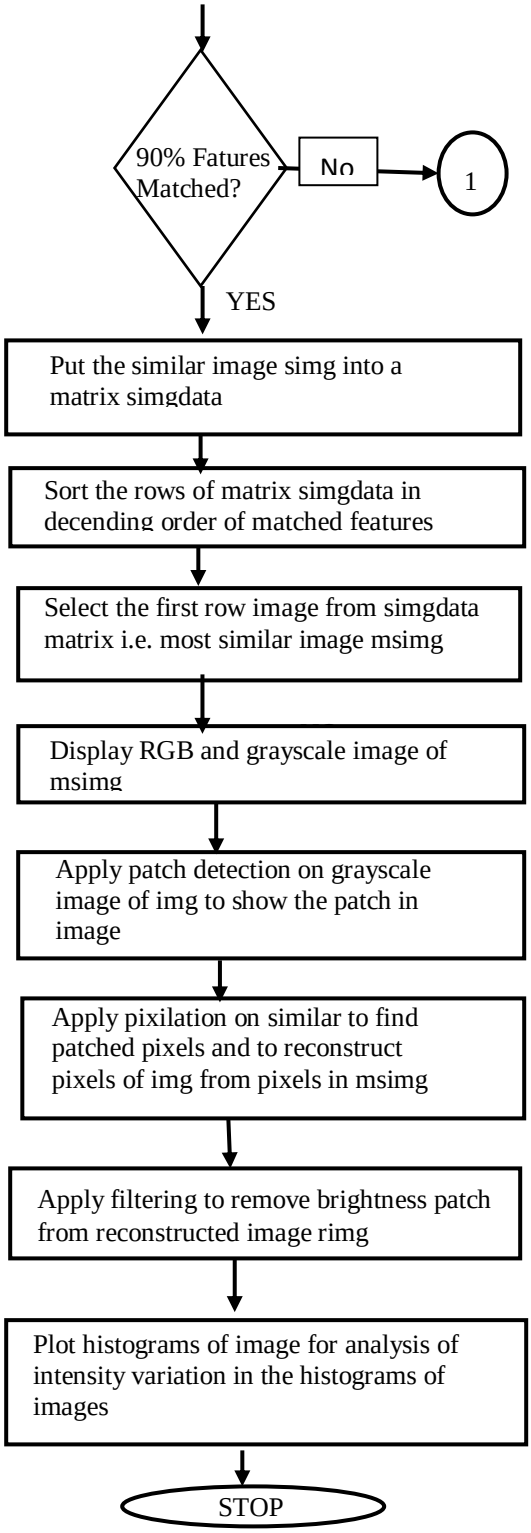
I. INTRODUCTION

This paper shows a newproposed method for reconstructing a damaged part or the patch of the image from its similar image. For this purpose the existing CBIR method is used with the other techniques and at the end the results of the accuracy of the reconstruction of the original image is calculates.

II. PROPOSED WORK

The proposed work starts by selecting an image folder as a database for finding similar image. Then a damaged image is selected. Its similar image based on feature vectors is found. The patch of damaged image is found in similar image and shown enlarged using pixilation. This patch is reconstructed and filtered for better visible impact of image. Then the intensity values shown in histogram are used to calculate accuracy of reconstruction process. The average of intensity values is also calculated at the end to get the clear idea of how feasible is the technique used for reconstruction is.





Flowchert1 Proposed work

III. CBIR

CBIR method is also known as query based image retrieval because it takes an RGB image as a queryinput to the system and then process that query to find the image from a huge database. This technique is use when the database containing images is very to find a single image from that database. A lot of work has been done in this field to improvise the technique or to get accurate results from the database. CBIR is better than the context based image retrieval which retrieves image from the database but on the basis of metadata because CBIR considers most about the conceptual things such as size, shape, color etc. of the image, these parameters are named as features of that image, so it achieves better results in finding the similar image.

CBIR technique includes mechanisms for detection of these features. The work presented here uses Gabor Wavelet, Wavelet Transform and Auto-corellogram as methods for detecting different features. After detecting features of the image the similar image is needed to be found out of the database and for that purpose CBIR system uses some similarity matrices which treated as basis for comparing images and similarities among images.

The paper has used Euclidian, cityblock, and Manhattan to find the similar image all the methods calculate the distances between the pixel points of the

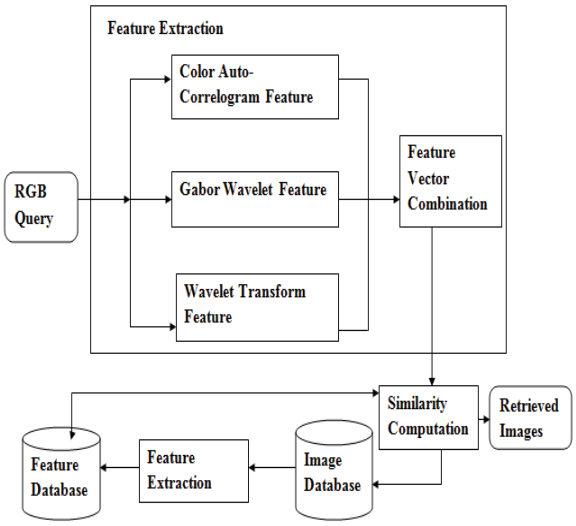


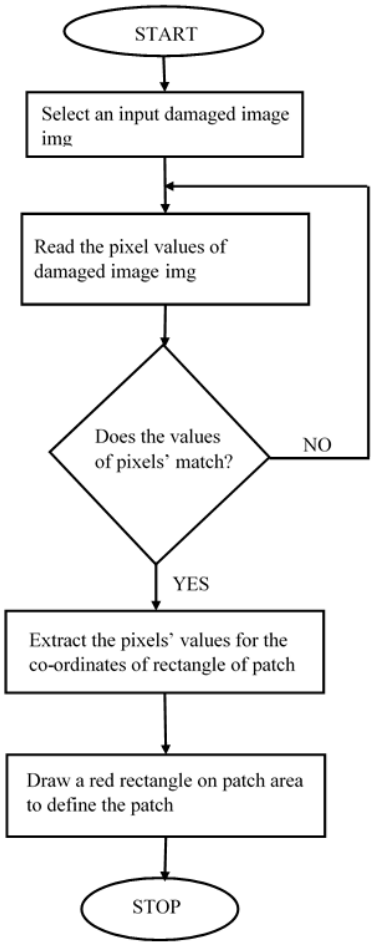
image with different calculating approach. This complete process is known as CBIR.

Fig1 CBIR model[1]

IV. Patch Detection

The paper deals with the images that has some patch as a white part in an image. To mark that white part of the damaged image in the similar image patch

detection is used. This paper merges the CBIR



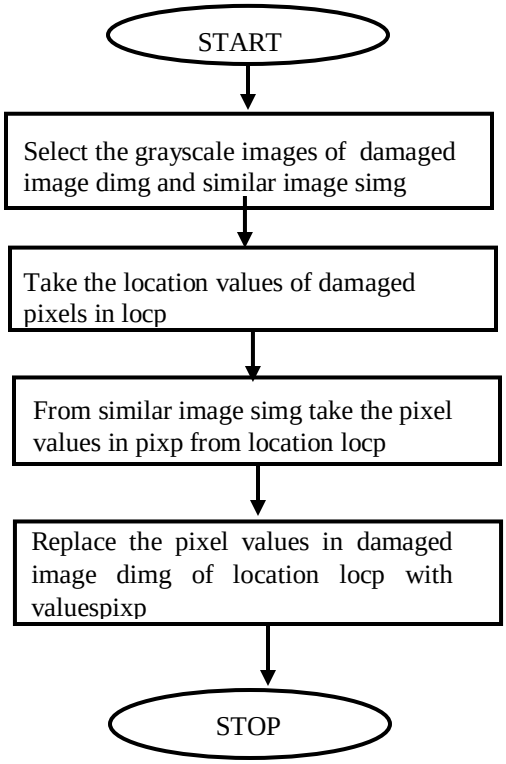
method with patch detection to show detected patch.

Flowchart2 for Patch Detection

V. PIXILATION

Pixilation is a method of enlarging or zooming a particular part or some pixels. This is use to show some portion of image to focus on that part. Pixilation may badly effect the quality of image because of too much stretching pixels get stretched so they start losing the resolution. But this method is usable when we need to capture attention onsome part of the, this can be use of crime investigation and detecting clues at the crime scenes.

After pixilation the original undamaged image is recovered using feature matching and improved clarity by removing brightness patch using filteration.



Flowchart3 for pixilation

VI. HISTOGRAM

After removing noise and patch from the damaged image this method used a histogram for comparing the intensity of the reconstruction the image to the intensity values of the original similar image. This comparison shows how accurately the image is reconstructed. These intensity values are shown by graphs in histogram method. We need to see the variation of the graph signals representing intensities of pixels. The results achieved with this method can be 97.71 % accurately reconstruct the image. The accuracy average reduces depending on the size of database as finding similarity matrices in larger databases is a difficult task to do so.

VII. RESULTS AND DISCUSSION

The main window displays all the buttons for executing our proposed method of reconstructing a damaged image. For this purpose these buttons allow operation sequence as selecting Database of image for feature extraction and creating dataset for query handling. Then this dataset is saved and a damaged image is selected to reconstruct and converted into

grayscale for pixilation as pixilation works on grayscale image.

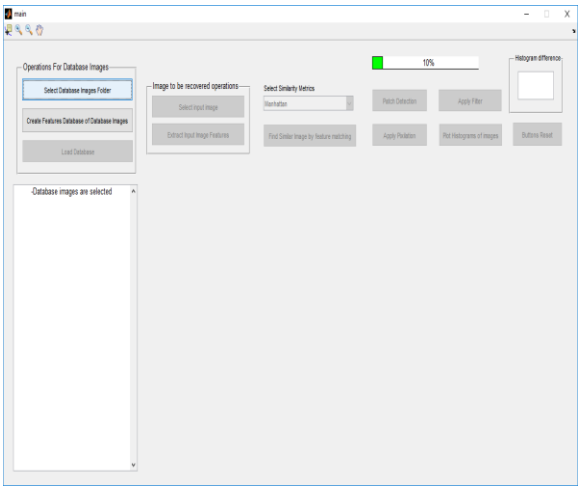


Fig2 Main Window

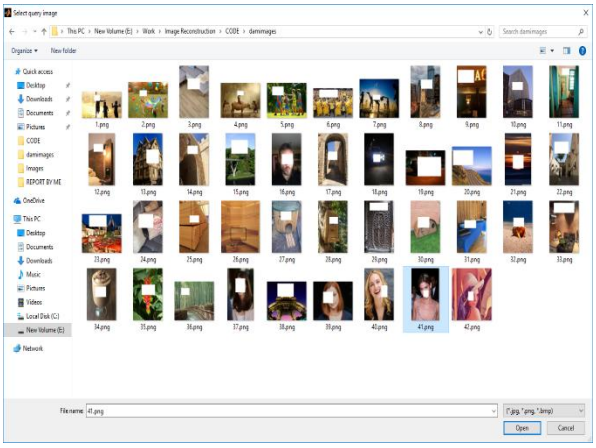


Fig3 Selecting damaged image form the damaged database folder

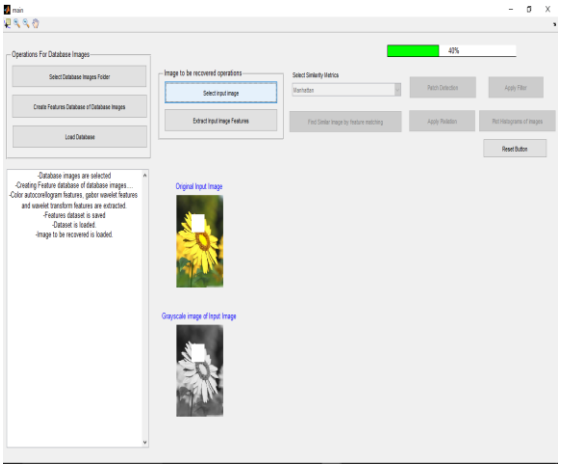


Fig4 Selected damaged image and its converted gray scale image

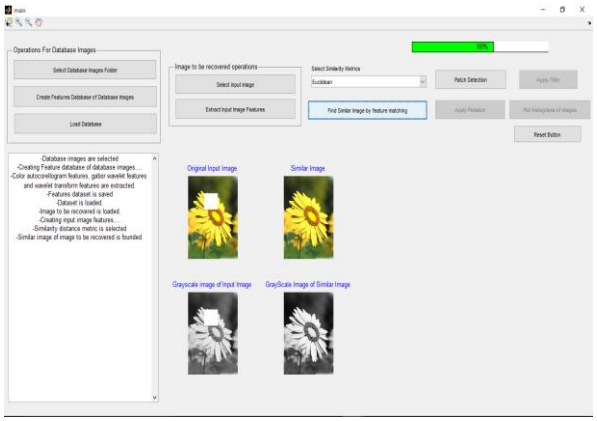


Fig5 Shown similar image and its grayscale image

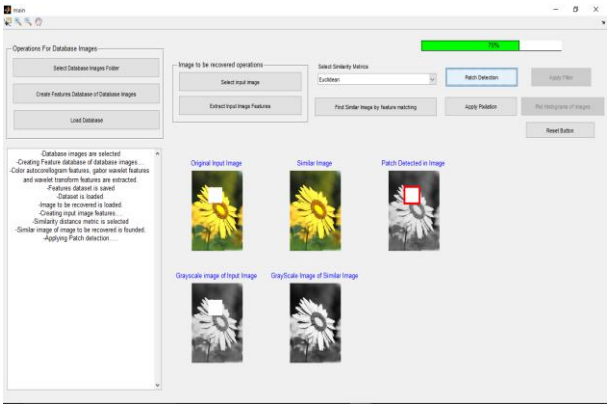


Fig6Patch detected in damaged image

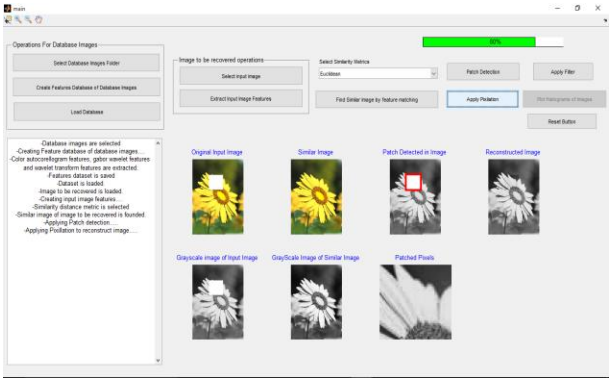


Fig7 Pixelated and Reconstructed image

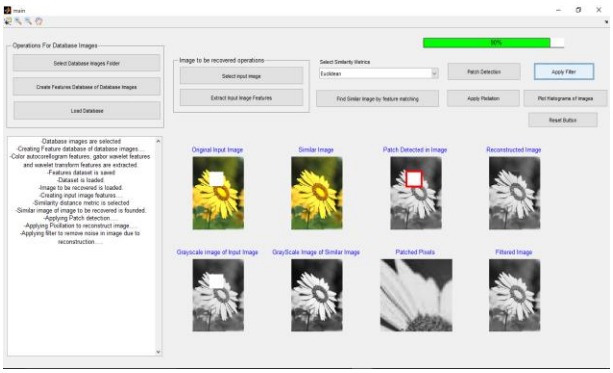


Fig8 Filtered Grayscale image

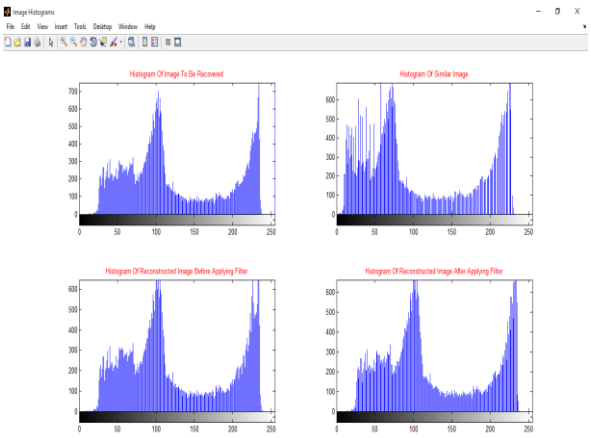


Fig9 Histogram of intensity values of original, damaged, recovered and filtered image.

By analyzing the intensity values of the similar and reconstructed image the intensity accuracy in reconstruction is calculated as follows:

Intensity of similar image (IS) = 254

Intensity of reconstructed image (IR) = 255

Intensity Accuracy in reconstruction (A):

$$A = 100 - \frac{I_R - I_s}{I_R} x100$$

$$A = 100 - \frac{255 - 254}{255} x100$$

$$A = 99.61\ \%$$

This is the accuracy of the image on calculating the average intensity accuracy of all the images in database it results nearly 97.71%. So the accuracy is quiet high even for the large size database.

VIII. CONCLIUSION

The proposed method for image reconstruction uses CBIR technique and subsumes that with other techniques such as pixilation, patch detection, filteration, reconstruction and histogram. The method can easily identify similar image from a database and reconstruct the patch of the damaged image accordingly. The reconstruction is based on replacing the values of the pixels of missing patch with the similar image pixel values of the same location. The average intensity varies between 97-99.9% the method can be used for finding image from an art gallery, identify criminal clue detection at crime scenes and can be improved in future for making it more efficient.

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