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Content Based Image Retrieval using Euclidean Distance Measure

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Abstract:- In the rapid growing use of web world, users are using texts, audios, videos and images in huge amount. At the same time, need of fast retrieval is basic requirement of searching. The summarized content-based image retrieval (CBIR) wants competent mining of low level features like color, texture and shapes for indexing and speedy similar question picture recovery.

Features are extracted from picture in the form of pixels-value. In this paper we examine the method of competent mining of color feature of picture.

In our process, for the competent mining of picture, Euclidean distance measure technique is used. The projected process is experienced by means of Corel dataset.

Keywords:- *CBIR, Euclidean Distance measure, similarity measure, image feature.*

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1. Introduction

Content Based Image Retrieval (CBIR) is a method for mining appropriate picture from a picture dataset. CBIR evaluates the likeness of pictures based on its pixel values and there are different formulae for evaluating this likeness among pictures. Based on the results of these formulae, likenesses among picture are evaluated.

For retrieving an image, CBIR uses color, shape, texture, figure and layout features; while color, shape and texture features are important. For color feature extraction, RGB model is most convenient to display any picture. This model divides any digital picture into three channels: Red Channel, Green Channel and Blue Channel. The RGB Value of any picture is ranges from 0 to 255.

2. Related Previous Research in CBIR

In [1,3], authors have analyzed the different types of distance metrics for extracting similar images. In [2], authors have quantized histogram texture features in the DCT domain. Different features of image are compared against precision, recall and response time in [4]. In [5], authors investigated different distances metrics for retrieval image from databases.

3. Proposed Work

In our proposed method, we first convert the image into Red, Green and Blue color channel and obtain the matrix of pixel-value of each from 0 to 255.

As shown in Figure1 below, we first read the query image and image from dataset. Then, calculate the Red, Green and Blue color channel of both the images respectively. Calculate the mean value and standard deviation of the matrix of pixel value for RGB.

Afterward, calculate the Euclidean Distance measure for correspondence colors for mean and standard deviation from the two images. Now we compare this distance value with the threshold value for evaluating similar images.

Euclidean Distance (d) between two points M=(a1,b1) and N=(a2,b2) is given by:

$$d(M,N) = \sqrt{(a1-a2)^2 + (b1-b2)^2}$$

Here, we have six values from each image, as below:

For First Image (i1):

rm1=Mean value for Red Channel
rs1=Standard Deviation for Red Channel
gm1=Mean value for Green Channel
gs1=Standard Deviation for Green Channel
bm1=Mean value for Blue Channel
bs1=Standard Deviation for Blue Channel

For Second Image(i2):

rm2=Mean value for Red Channel
rs2=Standard Deviation for Red Channel
gm2=Mean value for Green Channel
gs2=Standard Deviation for Green Channel
bm2=Mean value for Blue Channel
bs2=Standard Deviation for Blue Channel

Euclidean Distance between first image and second image will be:

$$d(I1,I2) = \sqrt{\sum(rm1-rm2)^2 + \cdots + (bs1-bs2)^2}$$

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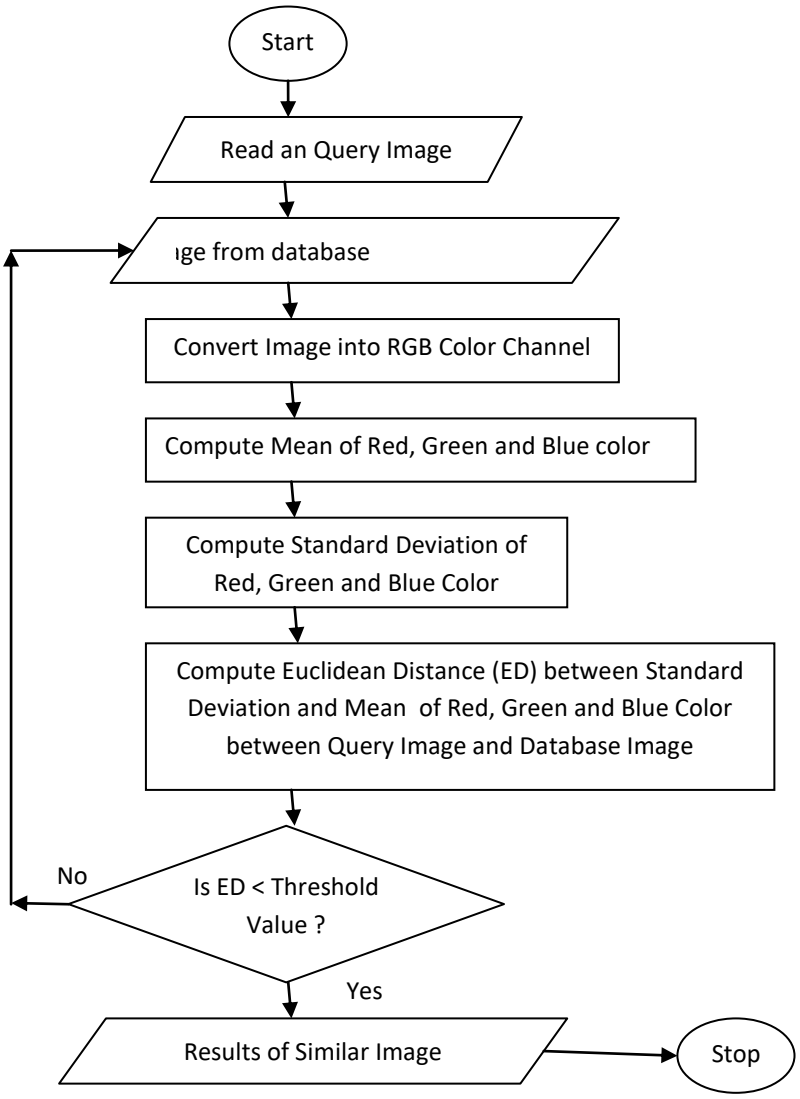

Figure1: Flow diagram of the proposed system

Test – I: Result of experiment for calculation of Euclidean Distance between first image and second image

SNo	Image No./Image (i1)	Image No./Image (i2)	d(i1,i2)
1	401 	401 	0.00
2	401	448 	17.5884
3	401	400 	22.4997
4	401	402 	22.4997

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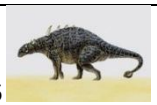
5	401	420 	29.7369
6	401	486 	30.2094
7	401	407 	30.6152
8	401	403 	33.1346
9	401	220 	172.2583
10	401	348 	202.6801

Test – II: Result of experiment for calculation of Euclidean Distance between first image and second image

SNo	Image No./Image (i1)	Image No./Image (i2)	d(i1,i2)
1	286 	298 	22.7424
2	286	299 	23.6668
3	286	202 	25.4859
4	286	284 	38.8600
5	286	278 	47.7997
6	286	283 	50.4119
7	286	220 	67.8752

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8	286	214 	72.8944
9	286	348 	86.2660
10	286	401 	121.5597

4. Conclusion

In conclusion, this paper has offered a unique method for color feature mining used in the CBIR. They attain considerable improvement in retrieval precision. In Euclidean Distance Measure the correspondence comparisons of pixel-values were accomplished. But proposed method illustrates the likeness between query images and trial images. The color feature of the trial image is to be match with the color feature of the query images. The projected methods are based on the distance measures of the Mean and Standard Deviation value of the two images.

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