International Journal of Engineering Sciences &Research Technology

(A Peer Reviewed Online Journal)
Impact Factor: 5.164

IJESRT

RESEARCHERID
THOMSON REUTERS

[Yadav* *et al.*, 8(7): July, 2019]
IC™ Value: 3.00

ISSN: 2277-9655
Impact Factor: 5.164
CODEN: IJESS7

IJESRT

INTERNATIONAL JOURNAL OF ENGINEERING SCIENCES & RESEARCH TECHNOLOGY

TO STUDY ANALYSIS OF COLOUR AND TEXTURE BASED IMAGE RETRIEVAL

Sujeeta Yadav[*1] & Prof. Achint Chugh[2]

[*1&2]Department of Digital and Communication, Mittal Institute of Technology Bhopal(M.P)

DOI: 10.5281/zenodo.3264826

ABSTRACT

Because of the advancement and improvement in innovation and web ,with rapid throughout the previous couple of years and the accessibility of a huge computerized picture accumulation, effective picture recovery frameworks are required and productive CBIR framework serve that need. In this, we will give an inquiry picture to the framework and framework will look for the comparative picture as that of the given question picture and recovery the picture which is most like that of the inquiry picture. For this, we will separate the highlights of question picture dependent on its shading and surface and contrast and the element of the database pictures put away in dataset . In this paper we present substance based picture recovery framework that utilizations shading and surface as visual highlights to portray the substance of a picture district For shading highlight extraction, we use blend of calculations, for example, HSV-Histogram, Color Correlogram, Color Moment. For surface element extraction, We have utilized Gabor channel and Wavelet Moment technique. Notwithstanding this a mix of shading and surface based recovery is additionally included to improve the exactness of the outcome.

KEYWORDS: HSV, Color Correlogram, Gabor filter, Color moments, etc.

1. INTRODUCTION

In this Digital world, there is parcel of information are store as picture, because of this there is a gathering of huge picture database in our system. So at whatever point we need a particular information or explicit picture, it is hard to look based on just content .Content based Image Retrieval (TBIR) won't give great outcome and isn't much effective. The generally use TBIR is Google Images. In any case, continuously, it is anything but an effective procedure . For finding the elective method for looking and defeating the confinements forced by TBIR frameworks progressively instinctive and easy to use Content Based Image Retrieval frameworks (CBIR) were created. "Content-based" implies that the pursuit framework which will dissect the real substance of the picture. Substance Based Image Retrieval is the way toward recovering the ideal inquiry picture from an immense number of databases dependent on the substance of the picture. Shading, surface, shape and neighborhood highlights are a portion of the general highlights utilized for recovering a specific picture from the database pictures . Substance Based Image Retrieval frameworks works with every one of the pictures and the hunt depends on examination of highlights with the question picture. Biomedicine, Military, Education, Web picture arrangement ,internet business online stages and looking are a portion of the zones where the CBIR method includes its significance. A portion of the models for the momentum CBIR are Viper which is Visual Information Processing for Enhanced Retrieval, QBIC which is Query by Image Content and Visual look for which is a web device for looking through pictures and recordings. CBIR for the most part diminishes the substantial remaining task at hand and conquers the issue of overwhelming subjectivity. [1]Content-based picture recovery (CBIR)is likewise named as question by picture content (QBIC) and substance based visual data recovery (CBVIR) is the use of PC vision to the picture recovery the issue of scanning for computerized pictures in huge databases is understood by this cbir framework. CONTENT-BASED picture recovery (CBIR) has gotten much significance in research field in the most recent decade , which is drived by the need of effectively taking care of the enormously developing measure of interactive media information and traffic with productive need of target based pursuit framework. Numerous CBIR frameworks have been created, including QBIC, PicHunter , MARS , NeTra. In a run of the mill CBIR framework, low-levelimage highlights like

ISSN: 2277-9655
Impact Factor: 5.164
CODEN: IJESS7

shading, surface, and shape are naturally separated for picture depictions . To look for attractive pictures, a client displays a picture as question of similitude, and the framework restores a lot of comparative pictures dependent on the removed highlights from the gigantic database of image. Such frameworks are compelling for some down to earth and mechanical CBIR applications. In this paper we are going to utilize two highlights of the picture which is shading and surface. The initial segment is processed by shading histogram HSV alongside shading autocorrelogram and shading minutes to recovered the shading parameters of the picture. Furthermore, the subsequent part is utilized for surface recovery utilizing GABOR wavelet transform. The removed highlights from all calculation are put away in a solitary exhibit and contrasted and the dataset accessible and stacked to the framework and we process the closeness among them and in this manner we show the bring about plunging request from the picture database.

2. IMAGE RETRIEVAL

Our proposed CBIR system can be divided into several component as follow:

1)Color Feature Extraction 2)Texture Feature Extraction
3)Similarity measure and Feature combination

1) Color Feature Extraction

In colour feature extraction, we are using three algorithms HSV-Histogram, Color Auto correlegram, Color Moment to extract the features of the image.

A. HSV-Histogram

As there are many shading space to speak to the he picture in computerized structure, the most widely recognized shading space for or advanced picture is RGB shading space model. Be that as it may, RGBB shading space isn't perceptually uniform. In HSV shading space, picture is speak to in the mix of Hue(0-360),Saturation(0-1),Value(0-1). Tone speaks to overwhelming shading, Saturation speaks to relative virtue of color, Value speak to power of color.HSV shading space is appropriate to human visual perception. In request to recover the shading highlight we convert the picture from RGB shading space to HSV shading , After that we separate the HSV plane. Then Quantization is connected to HSV shading space. Quantization is the way toward lessening the quantity of shading space by putting the comparative shading in same bin. Due to this quantization ,calculation and comparison time is decrease In our shading ,we use !2 receptacle quantization:8 canister for hue,2 container for saturation,2bin for value. As we have quantize the shading space ,presently this ought to be spoken to into shading descriptors. According to the quantity of pixels that have shading in each shading reach. A Color histogram of an info picture is characterized as a following vector H= {H[0], H [1], … H[i], …, H[N]}.(1.1)

Where i denotes the color bin in the color histogram. N denotes the total number of bins used in color histogram and H[i] denotes the total number of pixel of color I in an image.

B. Color Auto correlogram

As the above shading histogram technique is invarariant to pivot of the picture on the view hub. Shading correlogram gives the data about the highlights of hues. It incorporates spatial shading relationships, which depicts the worldwide conveyance of nearby spatial connection of hues and is anything but difficult to process. For each picture ,the RGB shading space is figured .We make a shading quantization of each picture utilizing 64 hues (4 levels for each channel), trailed by a picture ordering where a fixed shading Map is utilized. The auto correlogram of the listed picture is determined and put away in a component vector information base. For the HSV shading space, we map the first picture into the HSV shading space. A shading quantization is finished utilizing 75 hues . Such like 5 levels for H channel, 3 levels for S channel and 5 levels for V channel. At that point, the picture is ordered and the auto correlogram is determined and put away in a component vector information base and same procedure is Applied for question picture .

Color Moments

Shading minutes are one of the measures that can be utilized separate pictures dependent on their highlights of color. Once determined, these minutes give an estimation of color likeness between pictures. The estimations of likeness estimates which are measurements in our code would then be able to be contrasted with the estimations

ISSN: 2277-9655
Impact Factor: 5.164
CODEN: IJESS7

of pictures filed in a database for assignments like substance based image retrieval. Probability distributions are described by various extraordinary. Minutes Like here Normal dispersions are diverseiated by their mean and fluctuation. It, along these lines, follows up that if the shading in a picture pursues a specific likelihood circulate on, the snapshots of that conveyance would then be able to be utilized as features measures to distinguish picture dependent on shading and further utilized for recovery reason and improves our recovery productivity.

2) Texture Feature Extraction

A picture can be considered as a mosaic of surfaces and surface highlights related with the districts can be utilized to list the picture data[11].To separate surface element in a productive way and to it best way we are utilizing Gabor Filter(or Gabor wavelet) strategy.

Gabor Wavelet coefficients are used to represent the homogenous texture feature of the region:

(2.12) For a given image I(x, y) with size $P \times Q$, its discrete Gabor wavelet transform is given by a convolution:

$G_{mn}(x,y) = \sum\sum I(x-s,y-t)*\psi_{mn}(s,t)$ (2.2)

$$\sigma_{mn} = \frac{\sqrt{\sum\sum(|Gm(x,y)| - \mu_m)}}{P \times Q}$$

$$\sigma_{y,m,n} = \frac{1}{2\pi\tan(\frac{\pi}{2N})\sqrt{\frac{U^2h}{2in2} - (\frac{1}{2\pi\sigma_{x,m,n}})^2}} \quad (2.10)$$

$$\mu_{mn} = \frac{E(m,n)}{P \times Q}$$

(2.13)

where, *s* and *t* are the filter mask size variables, and ψ^*_{mn} is the complex conjugate of ψ_{mn} which is a part of following mother wavelet generated dilation and rotation.

$\Psi(x,y) = (1/2\pi\ \sigma_x\ \sigma_y)\exp[-0.5\{(x^2/\sigma^2)+(y^2/\sigma^2)\}]*\exp(j2\pi Wx)$ (2.3)

where *W* is called the modulation frequency. The self-similar Gabor wavelets are obtained through the generating function:

$$\psi_{mn}(x,y) = a^{-m}\ \psi(x, y) \quad (2.4)$$

where *m* and *n* specify the *scale* and *orientation* of the wavelet respectively, with $m = 0, 1, \ldots M\text{-}1$, $n = 0, 1, \ldots, N\text{-}1$, and

$x = a^{-m}(x\cos\theta + y\sin\theta)$ (2.5) $y = a^{-m}(-x\sin\theta + y\cos\theta)$ (2.6) where $a > 1$ and $\theta = n\pi/N$.

The variables in the above equations are defined as follows:

Hence a feature vector **f** (for texture representation) is created using mean and standard deviation

$$f = (\mu_{00},\sigma_{00},\mu_{01},\sigma_{01},\ldots\ldots,\mu_{45},\sigma_{45}) \quad (2.14)$$

ISSN: 2277-9655
Impact Factor: 5.164
CODEN: IJESS7

The texture similarity measurement of a query image *Q* and a target image *T* in the database is defined by:

$$D(Q,I) = \sum\sum d_{mn}(Q,I) \quad (1.9)$$

Where $d_{mn} = \sqrt{(\mu_{mn}^{Q} - \mu_{mn}^{T})^2 + (\sigma_{mn}^{Q} - \sigma_{mn}^{T})^2}$ (2.15)

If fgQ=($\mu_{00},\sigma_{00},\mu_{01},\sigma_{01},\ldots\ldots\ldots,\mu_{45},\sigma_{45}$) represents feature vector (**f**) of query image and fgT=(μ0 $\mu_{00},\sigma_{00},\mu_{01},\sigma_{01},\ldots\ldots\ldots,\mu_{45},\sigma_{45}$)represents feature vector (**f**)of database image, then distance between them is given by the Euclidean distance formula:

$$\sqrt{\sum} \quad f\ f \quad (2.16) \quad (2.7)$$

$W_{m,n} = a^{m}U_i$ (2.8)

$$\sigma_{x,m,n} = \frac{(a+1)\sqrt{2in2}}{2\pi a^{m}(a-1)Ui} \quad (2.9)$$

After applying Gabor filters on the image with different orientation at different scale, we obtain an array of magnitudes:

$$E(m,n) = \sum\sum \left| G_m(x,y) \right|$$
$$m = 0,1,...,M-1; n = 0,1,.....,N-1. \quad (2.11)$$

These magnitudes represent the energy content at different scale and orientation of the image. The objective of texture- based retrieval is to find images or regions with similar texture. It is assumed that we are interested in images or regions that have homogenous texture, therefore the following mean (μ) and standard deviation (σ) of the transformed

Where n is the number of features, i= 1,2...,n. Both images are the same for Δd=0 and the small value of Δd shows the relevant image to the query image.

3).Similarity measure and Feature combination

We utilized the relative L1 Manhattan separation measure, and on the other hand the L2 (Euclidean) separation to quantify the separation between highlight vectors. Highlight vectors (FV) with least separations to the FV of the picture being looked are the ones comparing to the pictures with most likenesses to the picture being looked. This separations are utilized as comparability measurements for our resultant yield and results are shown by the separation estimation yield

Euclidean: Take the square root of the sum of the squares of the differences of the coordinates. For example, if x=(a,b)x=(a,b) and y=(c,d)y=(c,d), the Euclidean distance between xx and yy is

Euclidean =√ *d* **(3.1)**

Manhattan: Take the sum of the absolute values of the differences of the coordinates.

For example, if *x*=(*a*,*b*)x=(a,b) and *y*=(*c*,*d*)y=(c,d), the Manhattan distance between *x*x and *y*y is

Manhattan = a-c + b-d (3.2)

ISSN: 2277-9655
Impact Factor: 5.164
CODEN: IJESS7

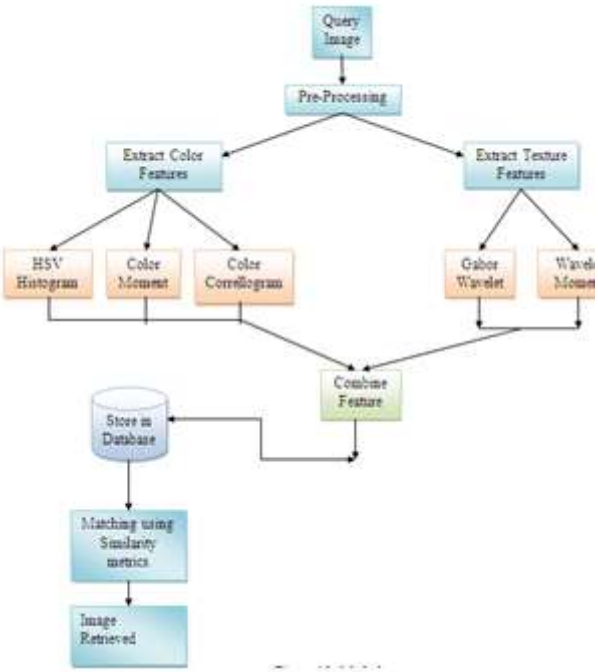

Figure 1: flowchart describing methodology of project

3. RESULTS

For assessment of the proposed strategy, it has been executed utilizing Matlab R2012 an and set of Image database with 500 pictures of clothes. In our framework png &jpeg, the two sorts of pictures are utilized for testing the proposed CBIR system. We have assembled 100 pictures in every class The dataset of each picture is determined and store in the database highlight vector structure. The database comprises of 5 unique classes of garments, for example, red garments, yellow garments, green garments, dark garments, white clothes. A inquiry picture is given by the client, at that point comparative pictures from the database are chosen and displayed. The result is acquired by separation correlations from the question highlight vector and the dataset of pictures where the variety of highlights is put away and contrasted and the component vector of the picture to get the outcome. The proposed framework utilizing shading and surface element extraction techniques yields better execution when contrasted with other CBIR highlight extraction method. Our fundamental accomplishment is that when the client gives an inquiry picture from the framework then our framework recover the comparable as that of the question from the database. For the exhibition of our framework, we have determined PRECISION and RECALL esteem.

On the basis of Precision and Recall, for calculating for various set of images, we get the average efficiency of 70%.

Table1.Precision and recall values obtained

SR.NO	TYPE OF DATASET IN DATABASE	PRECISION	RECALL
1	RED CLOTHES	0.65	0.8
2	YELLOW CLOTHES	0.68	0.85

ISSN: 2277-9655
Impact Factor: 5.164
CODEN: IJESS7

3	GREEN CLOTHES	0.80	0.72
4	BLACK CLOTHES	0.81	0.84
5	WHITE CLOTHES	0.76	0.75

Obtained result:
Step 1:Load the dataset in the project.

Figure 2. load dataset

Step 2:Browse the image for query input

Figure 3.load query image

ISSN: 2277-9655
Impact Factor: 5.164
CODEN: IJESS7

Step 3: click on query button to start the process & also select the no. Of output required.

Figure 4. result obtained based on similarity metrics

4. CONCLUSION

This undertaking presents the reasonable methodology of Content based Image Retrieval utilizing shading and surface highlights. The essential idea of this without having any arduous work of composing watchwords, we can utilize contribution as a picture and can recover required pictures dependent on shading and surface highlights. It has been discovered that variety in picture highlight extraction philosophies can guarantee the capable outcomes and progressively exact recovery of pertinent pictures from the enormous database. A definitive objective is to accomplish higher recovery productivity from enormous database of pictures by improving the speed, proficiency and precision. The outcomes are far superior than TBIR and recovery fills its need

5. FUTURE SCOPE

Content-Based Image Retrieval (CBIR) is a functioning region of research since the previous decade. A great deal of work is as yet being done here, which incorporates different applications, for example, security, medicinal imaging, sound and video recovery. The end clients of such frameworks can run from basic clients looking through a specific picture on the web to different sorts of expert bodies from the legislature and private associations, for instance, the police power for picture acknowledgment, writers mentioning pictures that match some question event(s), or architects researching in framework configuration attempt to locate the correct mapping of introductory inquiry pictures.

REFERENCES

[1] Mr.milind v.lande ,Prof.Praveen bhanodiya,Mr.Pritesh Jain"Efficient content based image retrival using color and texture "International Journal of Scientific & Engineering Research, Volume 4, Issue 6, June-2013
[2] ZHI-CHUN HUANG, PATRICK P. K. CHAN, WING W. Y. NG, DANIEL S. YEUNG,"CONTENT-BASED IMAGE RETRIEVAL USING COLOR MOMENT AND GABOR TEXTURE FEATURE" Proceedings of the Ninth International Conference on Machine Learning and Cybernetics, Qingdao, 11-14 July 2010
[3] S. Mangijao Singh, K. Hemachandran,"Content based Image Retrieval based on the Integration of Color Histogram, Color Moment and Gabor Texture"International Journal of Computer Applications (0975 – 8887) Volume 59– No.17, December 2012
[4] Amina Khatra" Content based Image Retrieval using Texture Contents", International Journal of Scientific Engineering and Research (IJSER), Volume 1 Issue 4, December 2013.
[5] Ashwitha P, Shivakumar G.S," Image Retrieval from Database using Different Image Features" Proceedings of the International Conference , "Computational Systems for Health &Sustainability"17-18, April, 2015 - by R.V.CollegeofEngineering,Bangalore,Karnataka,PIN- 560059,INDIA.
[6] Manimala Singhaand K.Hemachandran" Content Based Image Retrieval using Color and Texture" Signal & Image Processing : An International Journal (SIPIJ) Vol.3, No.1, February 2012.

ISSN: 2277-9655
Impact Factor: 5.164
CODEN: IJESS7

[7] S. Mangijao Singh, Raju Rajkumar, K. Hemachandran," Comparative study on Content based Image Retrievalbased on Gabor Texture Features at DifferentScales ofFrequency and Orientations" International Journal of Computer Applications (0975 – 8887)Volume 78 – No.7, September 2013
[8] Arpit Sameriya, Ms. Bhawana Sharma, "Content-Based Image Retrieval using Color Moments,Wavelet Moments & SVM Classifier" International Journal of Digital Application & Contemporary researchWebsite:www.ijdacr.com (Volume 2, Issue 11, June 2014)
[9] Dengsheng Zhang, Aylwin Wong, Maria Indrawan, Guojun Lu," Content-based Image Retrieval Using Gabor Texture Features" Gippsland School of Computing and Information TechnologyMonashUniversity Churchill, Victoria, 3842, Australia.
[10] S.R. Kodituwakku, S.Selvarajah," Comparison of Color Features for Image Retrieval" S.R. Kodituwakku et al. / Indian Journal of Computer Science and Engineering Vol. 1 No. 3 207-211.

CITE AN ARTICLE

It will get done by IJESRT Team