

# Content based image retrieval using image color feature based on varied direction and resolution filtering

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**Abstract:** This paper used the approach to retrieve content-based features from the image. The retrieval process having different methodologies for varied resolution handling process. Which also having the concept of handing varied rotations. As there is large amount of data is generated by different application thus a kind process is required which can store data in systematic form. This is not enough even some intelligent techniques are required that having ability to retrieve the information from saved data. The proposed approach is applied on image. The image store having varied resolution data. This resolution variation is due to the light source variation throughout the daylong. The angle of image is also varied with respect to the information available on scene. Thus, approach having ability to retrieve the required information in all scenario. By using combined feature extraction method by local energy, rotation-invariant and color features. The wavelet transforms to divide the picture into the advantages of the low-frequency and high-frequency characteristics, and establishes the multimedia processing technology model based on the wavelet transform this paper, features of local energy and are extracted in a high frequency domain of a gray image, using multi-directional resolution filtering.

**Keywords:** *CBIR-Content-based image retrieval, BVLC- Block variance of local correlation coefficient, LBP · Local binary pattern.*

**Introduction:** As per the researchers finding that the data being generated at very large speed as compared to the techniques available for processing it. Thus, the information retrieval from images is also an important research domain. By keeping in view in this research we retrieved the content from images using multi-directional resolution approach. The results achieved from the techniques show important improvement in demanded domain.

The existing techniques are like CBIR- Content based information retrieval broadly classified in three areas like texture, the shape and the color of that image. The statistical approach is used for texture data which having measurements based on intensities of figure. This method having approaches like histogram [1], BVLC- Block variance of local correlation coefficient [2], statistical moments [3]. The methods used in spectra include, LBP- Local binary patterns [4], Fourier transformation, Wavelet transformation, Gabor transformation. These methods are relating the modified LBP which include rotation-invariant uniform LBP (RULBP) [4]. The shape feature includes

With the excessive increase in the digital technology large amount of the data has been generated in the various forms. And due to rapid growth in the technology, acquisition of the digital information has become very popular and is being used for various purposes. Every day there are n-images that are being collected and studies for the different purposes such as medical images, advertisements, journalism, architectural and engineering designs. And now the issue arises how we can retrieve, organize, manage the large amount of data which is being collected from different sources.

For this purpose, image retrieval technology is the area where the researches are focusing. As we know that the large datasets of the images may contain similar images as well, thus researches are focusing on the technology to retrieve features from the images automatically and directly for the purpose of the similar images. [5]

A study on Content Based Image Retrieval (CBIR) has been actively studied for this purpose. There are old methods as well but which have been proven to be time consuming, laborious, inefficient. CBIR system is based on the visual content of the image such as shape, color and texture without using any textual descriptions of the image and the results of the image retrieved will have similar results to the image that is being queried about.

In paper [6] the author has proposed the technique to achieve the better retrieval performance in CBIR system; this paper generates three image features, namely Colour auto-Correlogram Feature, Gabor Wavelet Feature and Wavelet Transform Feature. In paper [2] author has proposed a method that uses a set of MRMD filters and presents a combination of methods for extracting colour and texture features, therefore increasing retrieval accuracy by using the filter set [8]. Moreover, unlike the existing experiments which predominantly used images of homogeneous texture patterns, the experiment described in this paper uses images that contain experimental objects.

The colour in the image is to identify the images effectively and the similarity between them is determined by the difference in each colour pixel [7]. The main requirement of the content based image retrieval system must have powerful feature values which may not get influenced by the rotation, transformation, sizes or translation of the images.

**Proposed Extraction Methodology:** The below diagram shows the processes involved in methodology. These are just to describe the steps in generic form without any technical details.

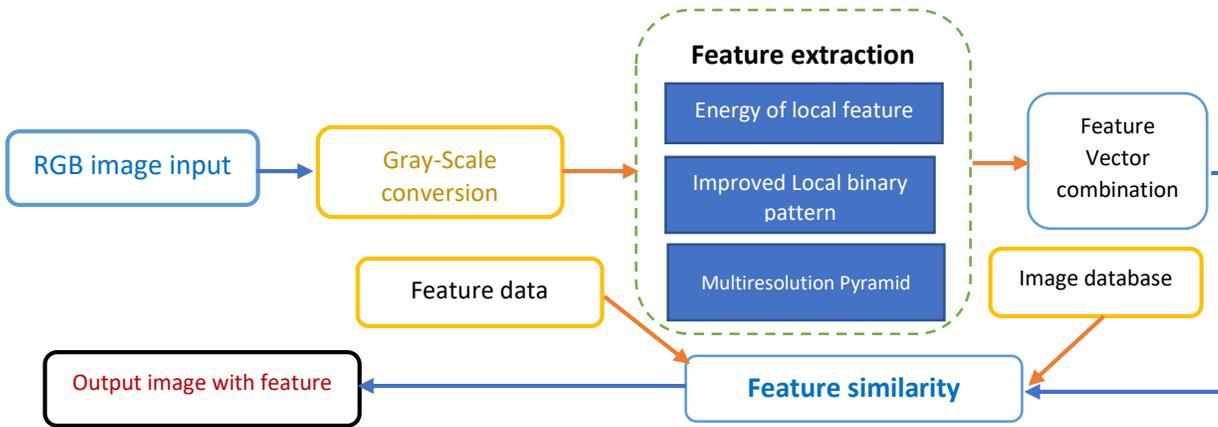


Figure 1: Proposed methodology

Equation 1: filter equation  $Z_{r,\phi}(p) = \sum_{q \in Q} j_{r,q} - f(p-q)$

The equation is for the high pass filter of the image.

**Experiments Results:** To show that proposed methodology is superior than the other compared methods.

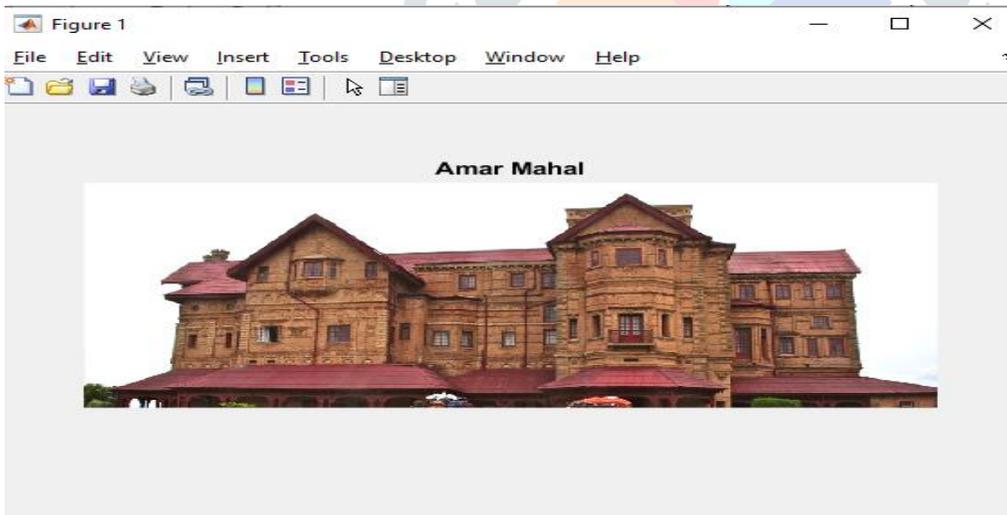


Figure 2: Image input -1

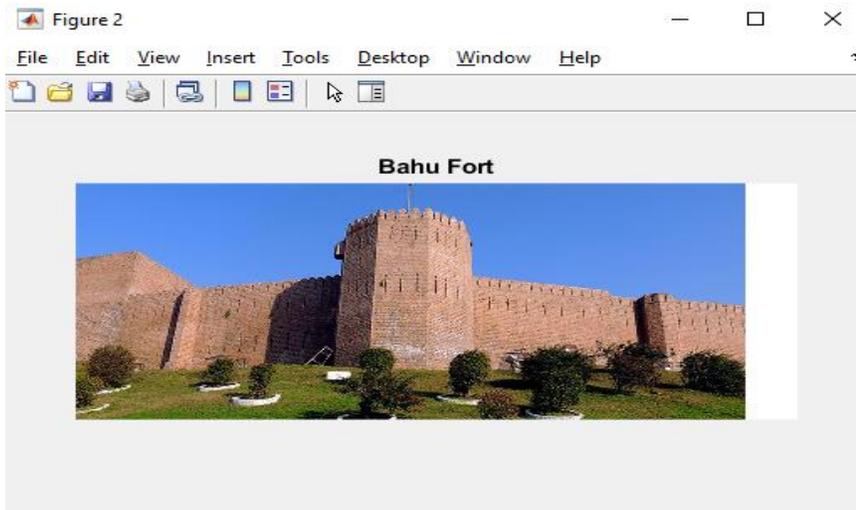


Figure 3: Image Input -2



Figure 4: Multi directional images of input images

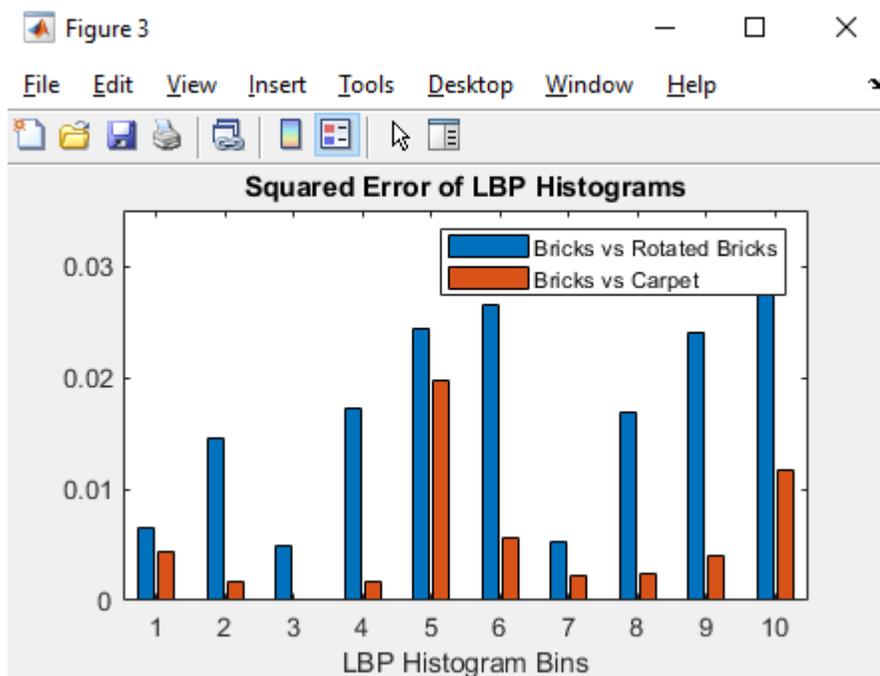


Figure 5: Histogram output of rotated image with non-rotated images

Table 1: Results comparison of proposed with other techniques

Method	Dimensions converted	Color spaces	Remarks
Histogram	128	RGB	Bin-1
Color autocorrelogram - RGB	128	RGB	3D

Color autocorrelogram - HS	64	HS	8:8
LBP	90	V	Bin-90
Local energy	18	V	Scale 1:4
RULBP	40	V	Dis 1:4
Purposed	120	HSV	Scale 1:4

### Conclusion:

In this paper we proposed a methodology which is in combination a multi-direction with multi-resolution. The different techniques and filters are applied for the experiment's purposes. It is also proposed variation in rotations as well as the variation in resolution of scene. This proposed approach shows that it is able to detect the feature even if there are varied angle of rotation. There may be different time scale picture because of the varied light source the resolution of the captured image may have different effects on capturing.

### References:

- [1]. Vipparthi, S. K., & Nagar, S. K. (2014). Color directional local quinary patterns for content based indexing and retrieval. *Human-centric Computing and Information Sciences*, 4(1), 6.
- [2]. Chun, Y. D., Seo, S. Y., & Kim, N. C. (2003). Image retrieval using BDIP and BVLC moments. *IEEE transactions on circuits and systems for video technology*, 13(9), 951-957.
- [3]. Mohamed, R., & Mohamed, M. (2016). A hybrid feature extraction for satellite image segmentation using statistical global and local feature. In *Proceedings of the Mediterranean Conference on Information & Communication Technologies 2015* (pp. 247-255). Springer, Cham.
- [4]. Ojala, T., Pietikainen, M., & Maenpaa, T. (2002). Multiresolution gray-scale and rotation invariant texture classification with local binary patterns. *IEEE Transactions on pattern analysis and machine intelligence*, 24(7), 971-987.
- [5]. Agarwal, Swati, Anil Kumar Verma, and Preetvanti Singh. "Content based image retrieval using discrete wavelet transform and edge histogram descriptor." *2013 International Conference on Information Systems and Computer Networks*. IEEE, 2013.
- [6]. Anandh, A., K. Mala, and S. Suganya. "Content based image retrieval system based on semantic information using color, texture and shape features." *2016 International Conference on Computing Technologies and Intelligent Data Engineering (ICCTIDE'16)*. IEEE, 2016.
- [7]. Cheng, J., Xu, R., Tang, X., Sheng, V. S., & Cai, C. (2018). An abnormal network flow feature sequence prediction approach for DDoS attacks detection in big data environment. *Computers, materials & continua*, 55(1), 95-119.
- [8]. Chun, Y. D., Seo, S. Y., & Kim, N. C. (2003). Image retrieval using BDIP and BVLC moments. *IEEE transactions on circuits and systems for video technology*, 13(9), 951-957.