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Color and Edge Oriented Histogram for Real-Time Costume Image Retrieval

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Abstract:

Costume based real-time image retrieval is challenging task to accomplish. Such an applications is used in many fields like digital photography, multimedia analysis etc. the proposed method uses color and shape features for image feature extraction. The color features are extracted using histogram and shape features are extracted using edge oriented histogram. The proposed algorithm extracts the features accurately and classification is done using SVM classifier. The results prove that the proposed algorithm works well on real-time images.

Keywords: image retrieval, color histogram, edge oriented histogram, SVM**.**

I. Introduction

Color is the most prevalent and unique visual specification. The current color properties extraction functions include color histogram [XII], color moment [XIII], color coat vector [IV] and color cablegram [IX]. In the current version of the MPEG-7 Final Committee draft, Histogram approved several color descriptions, including indexes [XV].Appearance is defined as the roughness or rigidity of the surface and the sequence with a sort of sequence. Many researchers have noted the local GLCM [XVI], LBP [XIX], and LDP [XVIII]. As the continuity of the application field continues, the new theory is like the Wavelet theory. In 1996, Tai Sing Lee [XVII] used the gear bar filters to collect decor methods. Object's most important feature is the dimensions. Classic shape indicators are the HU moment constantly [XIII], Fourier transform coefficients [III] and histogram of oriented gradients (HOG) [XIV]. Minority apparel picture has many visual specifications, which are more complex by a single attribute extraction algorithm. So our intensions are to create a specification extraction description dependence on multiple attributes of information manifested in multinitiated picture. The extraction of picture attributes based on multi-attribute description has been proposed in recent years. In 2010, Gong-Hi Liu an

picture feature depiction function is called a polymath histogram, [VI] for image retrieval. It integrates the benefits of co-occurring matrix and histogram by referring to the co-processing matrix's character using the histogram. In 2011, Gaihoy Liu's Micro-Structure Descriptor [VII] is based on the underlying color of micro-structures with the same edge.It effectively integrates color, texture, shape and color layout information for picture back. Gong-Hi Liu 2013 proposed a distinguishing color histogram [V], which measured the uniform color difference between two points under two distinct backgrounds in color and border trends in L * a * b. The above reflection extraction algorithms have achieved the highest returns in the Correl Image Database [XI].

A number of film features abstract algorithms have been successfully applied to multi-featured images, a paper that provides a comprehensive character description to obeys the great visual features presented in the chose costume picture.This description is indicated by an effective combination of color histogram and edge trend histogram. This is represented in experimental results as an efficient way to integrate integral features of picture representation techniques used in our approach.

II. Related Works

At Present identification work of the small Costume picture restore is still in its infancy and exploration stage. We are the first people to conduct exploration research on the retrieval technology of the minority costume picture. Here we will build a minority costume picture dataset, some of which take us to pictures and some from the data. Many of the minority dresses in these films worn by the minority people or the human body model, and some of the bricks of brick linens. Each ethnic group has its own costume style, so they can find the difference between ethnic groups with their clothes. After researching on the characteristics of minority garments in the United States, we will choose the outfit characteristic of racial groups with six features,Nationality, nationality, honey nationalism, Miao nationality, bouleva nationality and nationality. For every nationality we collect 100 clothing pictures and preset them to size 128 × 96 or 96 × 128 in JPEG format. Figure 1 shows some picture examples in the Minority Costume Image Dataset.

At present, any researcher has conducted research on minority costume image retrieval technologies. However, many scholars have researched the

general view of image processing technology (particularly in the e-commerce field). Choi Yu-Zu [XVII] provides a novel approach to retrieving the image of a single person with a question image from the image set captured through multiple CCTV cameras.First of all, the dress area was found on the basis of the face of the face area; It was then built for a divisional vector clothing area, designed by six sub-regions six-color histograms defined by the area of clothing. Wang provides a method for integrating the high-length [XX] design attributes, expression and matching clothing clothing image retrieval, where the image is from the image websites.Chen Jia-Lin [I] offers an interactive dress retrieval system, which supports the question of objective dress as an actual world film and returns realistic imagery with similar outfits. A novel stylistic feature has been proposed to describe textile shape in the human-based coordinate system. An oversight method has also been proposed to increase the inter-class distance and learn the waiting matrix to reduce intra-class distance.Wong etang [XXI] designs and implements the image search and restoration system based on the color attribute for e-commerce clothing. The paper compares the extraction techniques of different color properties and similarity measurement techniques. Experiments suggest that Euclidean metric and global color histogram are relatively appropriate for textile image search using RGB space.In general, all the above algorithms are designed to describe the attribute of the formal dress image from color clothing, shape and shape.

Figure 1. An example of the minority costume image dataset

An exploratory study, the paper's collaboration: (1) we will build the image of the minority textile image of six Yunnan nationals; (2) We propose global extraction techniques without any segmentation to decode the minority costume picture specification;(3) offer a better Canberra distance to assess the

similarity between two minority costumes; (4) We design and implement a web based minority clothing picture back-up system.

III. Feature Extraction of Minority Costume Image

Calculation of Color Histogram

Color is an important visual feature of human awareness and computer vision and is widely used in retrieving the film. Color histogram is one of the most direct and most effective color representations [X]. It has the advantages of the transition constant, rotating stagnation and scale constant, and is widely used in film search.But it does not have spatial information. The Paper Minority Dress contains spatial information by combining color histograms for many sub-blocks defined in the film. The correct color space and quantification are specified by the histogram representative. In this paper, three color spaces (RGB, HSV and CIE L * a * b *) are used to test the performance of our processes with different size numbers.The experimental results in tables 1-3 show that the RGB color space with the 8 × 4 × 4 = 128 qualification number is the best option in our frame. For an image with size of M × N, we set the color size to L and point the image by the equation c(x,y),x∈[0,N],y€[0,M The value range of C (x,y) , is [0, L) . We divide the image to n blocks. The color values of each block are denoted by C$C_i(x, y)i \in [0, N)$,the color histogram of each block is defined as:

$$H_{ci(x,y)}(j) = num_j, (j = 0,1, \dots., L-1) \quad (1)$$

where j num is the number of pixels in a sub-block whose color value is quantified to j.

Calculation of Edge Orientation Histogram

Here system's view of theory, fringe recognition plays an important role. This paper has built an adjective explanation orientation histogram, which can be seen as a design feature and a figurative feature. Classic Edge Detection Operation Sobel, Roberts, Privet and Coney.
Sobel is one of the most popular operators named InenneSobel and Gary Feldman [VIII]. In the horizontal and vertical directions, the sabel operators that connect the image with a small, different and full value filter are relatively inexpensive in terms of calculations.
The operator uses two 3 × 3 kernels, which compute the approximations of derivatives with the original image - one for horizontal transitions and one for

columns. If R, G and B are R, G and B with R, G and B coordinates, then R, G, B are defined as follows:

$$g_{rx} = [-101 - 202 - 101] * R, g_{Gx} = [-101 - 202 - 101] * G, g_{Gx} = [-101 - 202 - 100]*\text{B} \quad (2)$$

$$g_{RY} = [121000 - 1 - 2 - 1] * R, g_{Gy} = [121000 - 1 - 2 - 3] * G, g_{Gy} = [121000 - 1 - 2 - 1]*\text{B} \quad (3)$$

g ,yy g and xy g are defined as dot products of the vectors mentioned above:

$$g_{xx} = g_{Rx}^2 + g_{Gx}^2 + g_{Bx}^2 \quad (4)$$

$$g_{yy} = g_{Ry}^2 + g_{Gy}^2 + g_{By}^2 \quad (5)$$

$$g_{xy} = g_{Rx} \times g_{Ry} + g_{Gx} \times g_{Gy} + g_{Bx} \times g_{By} \quad (6)$$

Using the above notations, it can be seen that the maximum gradient orientation of point (,) x y is

$$\text{Q(x,y)} = \frac{1}{2} arctan\left(\frac{2g_{xy}}{g_{xx} - g_{yy}}\right) \quad (7)$$

And the gradient magnitude at (x, y) in the direction of ϕ(x,y) given by

$$G(x,y) = \left\{\frac{1}{2}[(g_{xx} + g_{yy}) + (g_{xx} - g_{yy})cos2\emptyset + 2g_{xy}sin2\emptyset]\right\}^{\frac{1}{2}} \quad (8)$$

Because tan( ) tan( ) α απ = ± , if ϕ0 is a solution to Eq. (7), the 0 ϕ ±π / 2 will be a solution, too. Furthermore, G G ϕ ϕ = +π ; therefore, Gxy (,) has to be computed only for values of ϕ in the half-open interval [0,) π . Because Eq. (7) provides two values 90° apart, this equation associates a pair of orthogonal directions with each point (,) x y :

$$G_1(x,y) = \left\{\frac{1}{2}[(g_{xx} + g_{yy}) + (g_{xx} - g_{yy})cos2\emptyset + 2g_{xy}sin2\emptyset]\right\}^{\frac{1}{2}} \quad (9)$$

$$G_2(x,y) = \left\{\frac{1}{2}[(g_{xx} + g_{yy}) + (g_{xx} - g_{yy})cos2\emptyset + 2g_{xy}sin2(\emptyset + \frac{\pi}{2})]\right\}^{\frac{1}{2}} \quad (10)$$

In practical applications, the maximum of the gradient direction is taken. Thus, we can denote the gradient direction ϕ(x,y) as follows:

$$\emptyset(x,y) = \begin{cases} \emptyset_0 & if\,(G_1,G_2)=G_1(x,y) \\ \emptyset_0+\frac{\pi}{2} & if\,(G_1,G_2)=G_2(x,y) \end{cases} \quad (11)$$

To facilitate implementation, we project it into the interval π [0, 2] . After the edge orientation ϕ(x,y)of each pixel has been computed, the orientations are uniformly quantized into m bins, where m = 12,18, 24,30,36 . Data in Tables 1-3 show that the 30 bins used in the RGB color space are more suitable for our framework. Indeed, the orientations are quantized into 30 bins, each corresponding to angle intervals of 12°. We use histogram of edge orientation to represent the feature of minority costume image. Because histogram is a statistical feature, which is lack of the spatial position information of the image. Therefore, in this paper, before the extraction of edge orientation histogram feature, we divide the minority costume image with a size of M×N into n sub-blocks first. The edge orientation values of each block is denoted by q(x,y)iE[(0,n)then the edge orientation histogram of each block is defined as

$$H_{\emptyset_i(x,y)}(j) = num_j \text{ ,(j=0,1,……..,m-1)} \quad (12)$$

where j num is the number of pixels in a sub-block whose orientation value is quantified to j.

IV. Experimental Results

Figure 2: Query Image

Figure 3: Search Result 1

Figure 4: Search Result 2

Figure 5: Search Result 3

Figure 6: Search result 4

V. Conclusion

The proposed image retrieval system is based on the color and shape features of the images present the database. The proposed system performs better in comparison to the existing techniques.

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