RESULTS

In the following sections the results will be introduced. In every image sequence the first photo is the query image and the followings are 3 results from the database.

Color structure descriptor

With the color structure descriptor one could get photos from the database by the query image based on the color distribution of the images. Except of some errors the color descriptor worked well.

Testing with synthetic photos the descriptor worked better.

Edge histogram descriptor

With this descriptor the main idea is that to split the image into 16 sub-blocks and compute an orientation histogram to every blocks.

The ANMRR values

Color Structure Descriptor

Database with synthetic images - ANMRR = 0.30555555555555552

Database with regular images - ANMRR = 0.36363636363636365

Edge Histogram Descriptor

Database with regular images - ANMRR =0.3636363636363637

Questions

1. Why several visual descriptors are needed?

Every descriptor follows a different aspect, investigates different characteristics of the image, like color distribution, shapes. Applying more than one descriptor for queries can give us better results.

2. Why other color spaces representation are needed, different from RGB space?

Most of the other representations take into consideration the HVS (human vision system). For example, with the YCbCr, the chroma values can be subsampled, this can lead to significant compressions during transmission of pictures/video. Also, e.g. the HSV is more expressive than the RGB, if one knows the saturation value, he/she can imagine how vivid a color is.

3. What is the motivation for the non-uniform HMMD color space quantization?

The HMMD space is a perceptually uniform color space. Each values represent perceptual factors, such as: Hue is the degree to which a stimulus can be described as similar to or different from stimuli that are described as red, green, blue, and yellow, Max specifies how much black color is present, Min specifies how much white color is present, Diff specifies how much a color is close to pure color.

4. What is the motivation behind the use of the "structured" color histogram, rather than a simple count of the image colors?

The simple, normal histogram doesn't look the structure of the image. The structured histogram makes it possible to compare images with similar color distributions that are differently structured.

5. What is the motivation of dividing each sub-image in approximately 1100 blocks, in the EdgeHistogram descriptor?

To have sufficient number of blocks for counting the different edge types. Each sub-image contributes with one local histogram. For these histograms to be useful, a large enough number of blocks is needed.

6. What is the procedure to determine the direction of each image-block in the EHD?

The ColorStructure descriptor represents the color distribution in an image, as well as its local spatial structure, not only the quantity of occurance of each color.

7. What is the main difference between the RegionShape and ContourShape descriptors?

The ContourShape descriptor can distinguish between shapes that have similar region-shape properties but different contour-shape properties. Objects shown in the figure below have a similar

region pixel distribution, but different contour properties, and thus contour-based descriptor can efficiently differentiate between such shapes.

1. Why visual descriptors need to be evaluated quantitatively?

If a visual descriptor is implemented in areas where its use has to be very accurate, the descriptor needs a metric. These purposes could be for example: in security area (e.g. luggage check at airports) and in clinical issues (e.g. visual diagnostic).

2. What were the main concerns underlying the definition of ANMRR criteria? Can this measure reflects the degree of user satisfaction of a given database image retrieval application?

Yes, it can reflect the degree of user satisfaction, because it uses a user-defined ground-truth for the measurement.

Represent a "standard" performance for different dimensions of the items list associated with each query.

3. Does ANMRR criteria is specific for this application or can also be used, more generally, in the evaluation of textual information search engines (google, yahoo, sapo, etc.)?

It can be used with search engines also, if we consider the hits as the images in database and the keywords as the query images.

4. Can ANMRR measure be considered as a signal to noise ratio?

No, a lower ANMRR value represents a better result for the queries. It measures a different kind of property. The quality of the descriptor to get a result for a query which is expected from it by the users. The false detections get a penalty, and these penalties increase the value of the ANMRR.