

A Self-selection of Adaptive Feature using DCT

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Abstract

The purpose of this paper is to propose a method to maximize the efficiency of a content-based image retrieval for various kinds of images. This paper discuss the self-adaptivity for the change of image domain and the self-selection of optimal features for query image, and present the efficient method to maximize content-based retrieval for various kinds of images.

In this method, a content-based retrieval system is adopted to select automatically distinctive feature patterns which have a maximum efficiency of image retrieval in various kinds of images. Experimental results show that the proposed method is improved 3% than the method using individual features.

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I. Introduction

In recent years, many researches for image retrieval is progressed actively in accordance with a broad utilization of multimedia. The key problems for applying content-based image retrieval to real applications are a self-adaptive capability for the change around the system and an efficient minimization of candidate images.

This paper discuss the self-adaptivity for the change of image domain and the self-selection of optimal features for query image, and present the efficient method to maximize content-based retrieval for various kinds of images.

II. Self-selection of Adaptive Feature

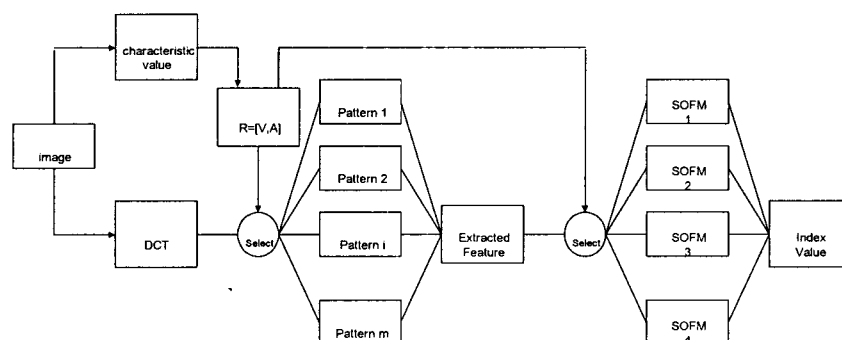


Fig 1. The functional diagram of the proposed system

We designed the system for (Fig. 1)

The functional diagram of the proposed system.

Content-based image retrieval using adaptive feature self-selection as shown in Fig. 1.

The most important thing in a content-based image retrieval system is to extract and use dominant features in image domain. If some changes in image domain is happened, it is necessary to extract different features.

To overcome the above problems, we proposed efficient technique which is called 'adaptive feature self-selection'. The method makes the retrieval system self-adaptive to input images. That is, the system organize and maintain an optimal internal state automatically by addition and deletion of features in accordance with the change of image domain.

The proposed adaptive feature self-selection has the distinctive quality as following.

The first, Our system is implemented using matrix R which is obtained from characteristic matrix V with characteristic values and analysis matrix A with clustering result for each feature vector. Analysis matrix A show the degree of clustering result for each input image.

| interval, 1, | Characteristic value | | | VS individual | | |
|-----------------|----------------------|-------|-------|---------------|--------------|---------|
| | Ev | Eh | Rho | max (93%) | min (75%) | average |
| 100 | 96% | 94% | 95% | +3% | +21 | 12% |
| 200 | 94% | 94% | 94% | +1% | +21 | 12% |
| 300 | 93% | 94% | 94% | +1% | +19 | 10% |
| 400 | 93% | 94% | 94% | +1% | +19 | 10% |
| 500 | 93% | 93% | 93% | - | +18 | 9% |
| 1000 | 93% | 93% | 93% | - | +18 | 9% |
| average | 94% | 93.7% | 93.8% | +1% | +19 | +10 |
| max | 96% | 94% | 95% | +3% | +21 | +12 |

Table 1. Experimental results

the proposed method is improved by 1%, 19%, and 10% than the maximum, the minimum, and the average, respectively. And as the maximum of the efficiency for three types of characteristic value is compared with the efficiency for individual features, the proposed method is improved by 3%, 21%, and 12% than the maximum, the minimum, and the average, respectively.

IV. Conclusions

To apply a content-based image retrieval system to real applications, in this paper, the solution method of two problems which are overcoming for domain limitation and selecting the features automatically is proposed and experimented.

The proposed method is improved than the maximum efficiency for individual feature vectors by 3% from experimental results. We confirmed that multiple feature vectors have an improved retrieval efficiency than the efficiency using individual features and, furthermore, all can be used to maintain the optimal efficiency for various kinds of images.

Further researches is needed about conversion method for feature vectors, diversity for characteristic values, and revised structure for neural network. Ultimately, we are going on constructing a content-based image retrieval system for large scale problems and real applications.

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