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SPATIAL IMAGE RETRIEVAL BASED ON DYNAMIC THRESHOLDING

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Abstract. *In this paper, we present a spatial image retrieval method based on dynamic thresholding. The proposed method can retrieve spatial image patterns with high accuracy and speed from images with complicated backgrounds. For simplicity, we consider the query images as specified rectangular-shaped or circular-shaped framed images. First, by introducing a dynamic thresholding system, the images can be partitioned into Peak Color Regions (PCRs). Consequently, the proposed method requires low computational complexity giving optimal feasible results for detection and segmentation. Due to compact representation and low complexity of color features, direct histogram comparison is to be used for extraction of PCRs. Since the number of the PCRs is much smaller than that of the image pixels, the proposed method allows a low dimensional image processing. The effectiveness of the proposed method is confirmed through experiments with various images.*

Keywords: Peak color region, Segmentation, Image retrieval, Dynamic thresholding, Histogram

1. **Introduction.** The rapid increasing amount of digital image collection has created the need for efficient and intelligent schemes for image retrieval. Since manual annotation of large image databases is both expensive and time consuming, it is desirable to make such a process automatic on image content. Indeed, the field of Content-Based Image Retrieval (CBIR) has made significant advances in recent years [1-3]. The most important and challenging components of CBIR systems are detection and segmentation, which are considered in this paper based on the concept of peak color. Although significant progress has been made in texture segmentation [4-6] and color segmentation [7-10], the peak color segmentation remains worth to be focused on. Color-based retrieval was first evolved from simple statistical measures such as average color to color histograms and spatial color descriptors [11,12]. Most researches have been devoted in recent years, to the definition of effective and efficient tools for specifying visual query and implementing retrieval strategies that satisfy some criteria of matching or pictorial similarity. All these works depend on the definition of robust and efficient color features that can represent image contents.

In general, color is the most straightforward information which can be easily retrieved from digital images with simple and compact description. Among the low level features such as color [13-15], texture [16,17] and shape of objects [18], color features can be calculated efficiently because of its less sensitivity to scale, rotation and translation of the image content. Swain and Ballard [19] firstly proposed to represent the color of image through color histogram. Then, they performed similarity retrieval by evaluating the histogram intersection between reference and database images. After that, many researchers