Backlight Image Enhancement Technique based on Multi-range Stretching in Color Histograms

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Abstract—This paper proposes a novel contrast enhancement method which determines the stretching ranges based on the distribution densities of segmented sub-histogram of a backlight image. In order to enhance the contrast of image effectively, the histogram is segmented into sub-histograms based on the density in each brightness region. Then the stretching range of each sub-histogram is determined by analyzing its distribution density. The higher density region is extended wider than the lower density region in the histogram of RGB colors. This method solves the over stretching problem, by stretching based on density rate of each area in the three RGB-histograms. Consequently, the object appeared dark due to backlight is now seen clearer and more visually natural image is extracted. To evaluate the performance of the proposed algorithm, the experiments have been carried out on complex contrast images and its work has been confirmed by comparing with the conventional methods.

Keywords-divide; histogram; stretching algorithm; improvement of contrast