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Vector Quantization Based on Vector Difference Scheme for Image Enhancement

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Abstract : Vector quantization algorithm which uses minimum distance calculation for codebook generation, a time consuming calculation performed on each pixel values leads to computation complexity. The codebook is updated by comparing the distance of each vector to their centroid vector and measure for their closeness. In this paper vector quantization is modified based on vector difference algorithm for image enhancement purpose. In the proposed scheme, vector differences between the vectors are considered as the new generation vectors or new codebook vectors. The codebook is updated by comparing the new generation vector with a threshold value having minimum error with the parent vector. The minimum error decides the fitness of each newly generated vector. Thus the codebook is generated in an adaptive manner and the fitness value is determined for the suppression of the degraded portion of the image and thereby leads to the enhancement of the image through the adaptive searching capability of the vector quantization through vector difference algorithm. Experimental results shows that the vector difference scheme efficiently modifies the vector quantization algorithm for enhancing the image with peak signal to noise ratio (PSNR), mean square error (MSE), Euclidean distance (E_dist) as the performance parameters.

Keywords : codebook, image enhancement, vector difference, vector quantization
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