Variable Blocksize Wavelet Transform Image Coding

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ABSTRACT

Wavelet transform has been received a great interest because it provides a multiresolution representation of images. Wavelet transform is now a widely used technique in image compression. By way of vector quantization technique, the wavelet transformed coefficients can be compressed further. For real time image compression, achieving high data compression ratio and coding efficiency at the same time are both important. In this study, we have proposed a quadtree segmentation method for image preprocess. Quadtree segmentation algorithm is used to divide an given image, where regions with image detail will be segmented into blocks with smaller block size, and the background of the image will be assigned larger block size. After the wavelet transform, to select appropriate size for codebook, bit allocation assignment is applied associated with the variance of each subband image block. We have also adopted rate-distortion concept to adjust the compressed bit rate. For this proposed compression scheme, simulation results show that we can achieve acceptable visual quality and high compression ratio simultaneously. Furthermore, due to the size of the codebook is small, we are able to save the computational time. System performance analysis will be demonstrated in this thesis.

Keywords : Quadtree Segmentation ; Wavelet Transform ; Bit Allocation ; Vector Quantization

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