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图形、图像、模式识别

基于量化的二维DCT优化算法研究

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摘要 DCT变换广泛应用于图像压缩算法中，在大多数情况下最有用的信息集中在DCT系数的低频序列中，而对那些经过量化后为零的系数进行计算，不但费时且计算量大幅增加。据此提出了两种新的二维DCT快速截取算法，使得计算一个8×8的二维DCT变换所需的乘法运算次数减少了60%，加法运算次数减少了77%。经过实验验证该算法在峰值信噪比PSNR值损失很少的情况下，显著地降低了算法的复杂度。

关键词 离散余弦变换 量化 图像压缩

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Fast algorithm of 2-D discrete cosine transform based on quantization

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Abstract

The Discrete Cosine Transform（DCT） has become more and more popular in practical digital image process.In general，the most useful coefficients of the DCT concentrate in the low frequency orders.It is consuming time and increasing calculation for the calculation of zero coefficients.According to the characteristic of the quantized coefficients，two new optimized algorithms are proposed for the computation of a 2-D discrete cosine transform in this paper.The calculation of coefficients of a 8×8 DCT only need 32 multiplications and 108 additions.The total number of multiplications is reduced 60%，and the total number of additions is reduced 77%.The results show that for practical situations，significant computation reductions can be achieved while causing negligible PSNR degradation.

Key words Discrete Cosine Transform（DCT） quantization image compression

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