

Design of image-adaptive quantization tables for JPEG

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Abstract. *The rate-distortion trade-off in the discrete cosine transform-based coding scheme in ISO/JPEG is determined by the quantization*

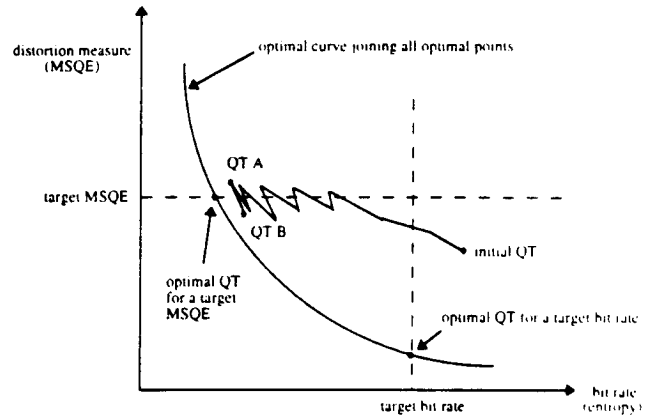
higher compression ratio (or lower bit rate) by representing

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| | | | | | | | |
|----|----|----|----|-----|-----|-----|-----|
| 16 | 11 | 10 | 16 | 24 | 40 | 51 | 61 |
| 12 | 12 | 14 | 19 | 26 | 58 | 60 | 55 |
| 14 | 13 | 16 | 24 | 40 | 57 | 69 | 56 |
| 14 | 17 | 22 | 29 | 51 | 87 | 80 | 62 |
| 18 | 22 | 37 | 56 | 68 | 109 | 103 | 77 |
| 24 | 35 | 55 | 64 | 81 | 104 | 113 | 92 |
| 49 | 64 | 78 | 87 | 103 | 121 | 120 | 101 |
| 72 | 92 | 95 | 98 | 112 | 100 | 103 | 99 |

Fig. 1 The quantization table for the luminance component documented in the ISO/JPEG draft international standard.

DCT basis functions measured under certain conditions. To achieve different bit rates and fidelity, a popular practice is



pensive to convert the DCT coefficients to pixel values at each iteration. Second, the MSOE can be weighted by a

actual bit rate
0.25]

is the low-frequencies because it is the energy compaction

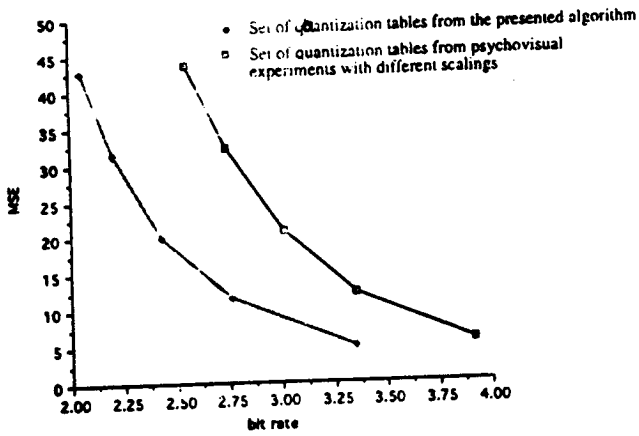


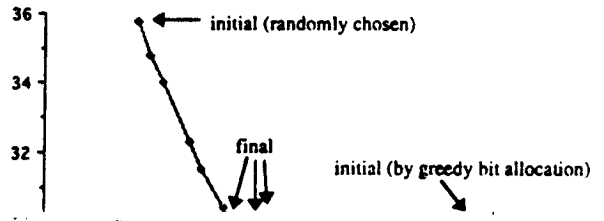
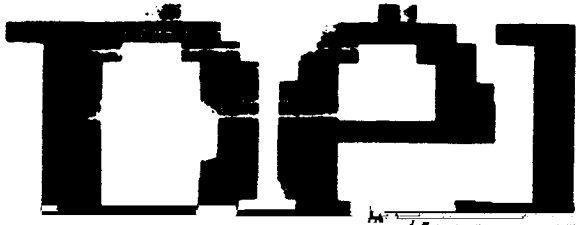
Fig. 6 MSE versus bit rate curves for a text image. The points are determined using the set of optimized quantization tables obtained from the algorithm and the set of scaled, standard quantization tables. There is about a 14% to 20% reduction in bit rate using the optimized quantization tables at the same distortion value.

The quality of the reconstructed images using the optimized quantization tables and the scaled, standard tables are



(a)

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Fung and Parker

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