

About the Cover

JPEG Image Compression

This month's cover was produced entirely by David Austin, who also wrote the article on JPEG in this issue. He tells us:

The cover illustrates some aspects of the JPEG compression algorithms. In the background is a detail of the photograph blown up so that individual pixels become visible. The JPEG algorithm groups these pixels into 8 by 8 blocks, one of which is highlighted to the left of the photograph. Moving to the lower right, we see the luminance values for the pixels in another 8 by 8 block, the quantized Discrete Cosine Transform (DCT) coefficients representing the luminance values, and the zigzag order in which these coefficients are recorded. Finally, in the bottom center is a sequence of numbers—the ordered DCT coefficients for the luminance and blue and red chrominance values—describing the block just to the left and the reconstruction of the block from that sequence.

In the lower left is a representation of the wavelet coefficients that result when the JPEG 2000 algorithm, in which the Discrete Cosine Transform is replaced by a Discrete Wavelet Transform, is applied to this 16 by 16 block. The coefficients in the upper left corner of this block give a lower resolution version of the larger block. The blocks in the other three corners contain the information needed to reconstruct the full 16 by 16 block from the lower resolution.

—Bill Casselman, Graphics Editor
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