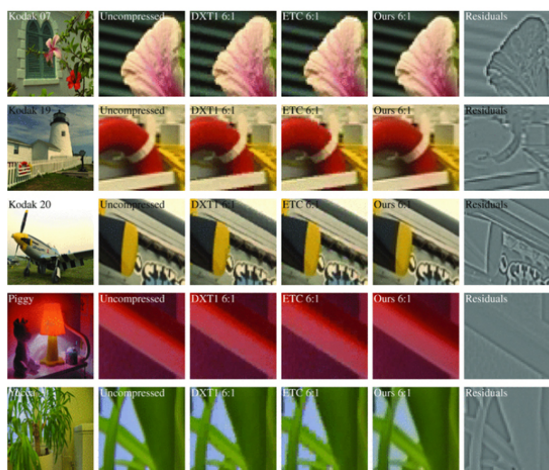


Adaptive Compression of Texture Pyramids

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High-quality texture minification techniques, including trilinear and anisotropic filtering, require texture data to be arranged into a collection of pre-filtered texture maps called mipmaps. In this paper, we present a compression scheme for mipmapped textures which achieves much higher quality than current native schemes by exploiting image coherence across mipmap levels. The basic idea is to use a high-quality native compressed format for the upper levels of the mipmap pyramid (to retain efficient minification filtering) together with a novel compact representation of the detail provided by the highest-resolution

mipmap. Key elements of our approach include delta-encoding of the luminance signal, efficient encoding of coherent regions through texel runs following a Hilbert scan, a scheme for run encoding supporting fast random-access, and a predictive approach for encoding indices of variable-length blocks. We show that our scheme clearly outperforms native 6:1 compressed texture formats in terms of image quality while still providing real-time rendering of trilinearly filtered textures.