

Abstract Details

Title: An Enhanced Approach for Low Bit Rate Image Compression

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Abstract: In this proposed work, we are going to use a practical approach of uniform down sampling in image space and yet making the sampling adaptive by spatially varying, directional low-pass pre-filtering. The resulting down-sampled pre-filtered image remains a conventional square sample grid, and, thus, it can be compressed and transmitted without any change to current image coding standards and systems. The decoder first decompresses the low-resolution image and then up-converts it to the original resolution in a constrained least squares restoration process, using a 2-D piecewise autoregressive model and the knowledge of directional low-pass pre-filtering. The proposed compression approach of collaborative adaptive down-sampling and up-conversion (CADU) outperforms JPEG 2000 in PSNR measure at low to medium bit rates and achieves superior visual quality, as well. The superior low bit-rate performance of the CADU approach seems to suggest that over-sampling not only wastes hardware resources and energy, and it could be counterproductive to image quality given a tight bit budget.

Keywords: Image Compression, Directional Pre-Filtering.