Low-complexity Compression of High Dynamic Range Infrared Images with JPEG compatibility - DTU Orbit (01/02/2019)

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We propose a low-complexity High Dynamic Range (HDR) infrared image (IR) coding algorithm assuming the typical case of IR images with an active range of more than 8 bit depth, but less than 16 bit depth. First, we separate an input image into base and residual images with maximum 8 bit depth each. Then we compress each image by a JPEG baseline encoder and include the residual image bit stream into the application part of JPEG header of the base image. As a result, the base image can be reconstructed by JPEG baseline decoder. If the JPEG bit stream size of the residual image is higher than the raw data size, then we include the raw residual image instead. If the residual image contains only zero values or the quality factor for it is 0 then we do not include the residual image into the header. Experimental results show that compared with JPEG-XT Part 6 with ’global Reinhard’ tone-mapping, the proposed approach has lower complexity and similar rate-distortion performance on IR test images.

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