A Survey on Lossless Compression of Bayer Color Filter Array Images

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Abstract : Although most digital cameras acquire images in a raw format, based on a Color Filter Array that arranges RGB color filters on a square grid of photosensors, most image compression techniques do not use the raw data; instead, they use the rgb result of an interpolation algorithm of the raw data. This approach is inefficient and by performing a lossless compression of the raw data, followed by pixel interpolation, digital cameras could be more power efficient and provide images with increased resolution given that the interpolation step could be shifted to an external processing unit. In this paper, we conduct a survey on the use of lossless compression algorithms with raw Bayer images. Moreover, in order to reduce the effect of the transition between colors that increase the entropy of the raw Bayer image, we split the image into three new images corresponding to each channel (red, green and blue) and we study the same compression algorithms applied to each one individually. This simple pre-processing stage allows an improvement of more than 15% in predictive based methods.

Keywords : bayer image, CFA, lossless compression, image coding standards
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