An Efficient Image Compression using Singular Value Decomposition with Scale Invariant Feature Transform

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Abstract

We propose a novel compression scheme for digital images using chrominance channels with feature descriptor and Singular Value Decomposition (SVD). The feature descriptor of chrominance channel is based on their error metrics. We describe an input image based on its down-sampled version and local feature descriptors. The chrominance channel descriptors are used to retrieve feature descriptive images and identify corresponding patches. The down-sampled image serves as a target to stitch retrieved image patches together. The feature vectors of local descriptors are predicted by the corresponding vectors extracted in the decoded down-sampled image. The image is decomposed by using SVD and then the rank is being reduced by ignoring some of the lower singular values as well as rows of hanger and aligner matrices. Experimental results demonstrate the effectiveness of the proposed scheme. The overall compression process supports to reach a acceptable level for image transmission in limited bandwidth over a telecommunication medicine application. We analyzed the performance of image compression technique using metrics Colorization Level (CL), Compression Ratio (CR), Peak Signal to Noise Ratio (PSNR), Visual Signal to Noise Ratio
(VSNR), Multi-Scale Structural SIMilarity Index (MSSIM) and Noise Quality Measure (NQM).

References


Index Terms

Computer Science  Image Processing

Keywords

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