

Image Compression Based on Regression SVM and Biorthogonal Wavelets

Authors : Zikiou Nadia, Lahdir Mourad, Ameer Soltane

Abstract : In this paper, we propose an effective method for image compression based on SVM Regression (SVR), with three different kernels, and biorthogonal 2D Discrete Wavelet Transform. SVM regression could learn dependency from training data and compressed using fewer training points (support vectors) to represent the original data and eliminate the redundancy. Biorthogonal wavelet has been used to transform the image and the coefficients acquired are then trained with different kernels SVM (Gaussian, Polynomial, and Linear). Run-length and Arithmetic coders are used to encode the support vectors and its corresponding weights, obtained from the SVM regression. The peak signal noise ratio (PSNR) and their compression ratios of several test images, compressed with our algorithm, with different kernels are presented. Compared with other kernels, Gaussian kernel achieves better image quality. Experimental results show that the compression performance of our method gains much improvement.

Keywords : image compression, 2D discrete wavelet transform (DWT-2D), support vector regression (SVR), SVM Kernels, run-length, arithmetic coding

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