

A Region Based Easy Path Wavelet Transform for Image Compression

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In [1] G. Plonka proposed an innovative method for image compression: successively finding a suitable path in the image (i.e. reducing it to a one-dimensional signal) and applying one level of a one dimensional wavelet transform. This yields a sparse representation which behaves better than the typical tensor product wavelet transform. However there are adaptivity costs: for each level one has to store the path, i.e. a permutation of the pixel points.

We propose a variation on this method, which consists in first segmenting the image into regions, then successively for every level find in each region a path (in some canonical manner, not depending on the pixel values) and apply a one-dimensional wavelet transform to it. This method can also be used to encode only the information needed to reconstruct a region of interest. We will discuss various details of this approach and present some numerical experiments.

[1] G. Plonka, The easy path wavelet transform: A new adaptive wavelet transform for sparse representation of two-dimensional data, *Multiscale Model. Simul.* 7 (2009), 1474–1496.