BANDELET REPRESENTATIONS FOR IMAGE COMPRESSION

Erwan Le Pennec, Stephane Mallat

CMAP/ Ecole Polytechnique

ABSTRACT

To improve image representations, it is necessary to take advantage of the geometrical regularity of singularities along edges. Bandelets are orthogonal families, that can be adapted to capture singularities that evolve regularly along smooth geometrical contours, with few non-zero coefficients. They are constructed from one-dimensional foveal wavelets, that are orthogonal one-dimensional functions that approximate signals with a strategy similar to the retina. Images are partly represented with bandelet coefficients along edges, plus a residual which is decomposed in a regular two-dimensional wavelet basis. The edge curves are chosen to minimize the error for a given number of non-zero bandelet and wavelet coefficients. They are represented in a one-dimensional wavelet basis. An application to image compression will be shown, including a comparison with JPEG-2000.

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