



Multifractal analysis of three-dimensional histogram from color images

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Résumé en anglais
Natural images, especially color or multicomponent images, are complex information-carrying signals. To contribute to the characterization of this complexity, we investigate the possibility of multiscale organization in the colorimetric structure of natural images. This is realized by means of a multifractal analysis applied to the three-dimensional histogram from natural color images. The observed behaviors are confronted to those of reference models with known multifractal properties. We use for this purpose synthetic random images with trivial monofractal behavior, and multidimensional multiplicative cascades known for their actual multifractal behavior. The behaviors observed on natural images exhibit similarities with those of the multifractal multiplicative cascades and display the signature of elaborate multiscale organizations stemming from the histograms of natural color images. This type of characterization of colorimetric properties can be helpful to various tasks of digital image processing, as for instance modeling, classification, indexing.

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