Fractal capacity dimension of three-dimensional histogram from color images

Titre	Fractal capacity dimension of three-dimensional histogram from color images
Type de publication	Article de revue
Auteur	Chauveau, Julien [1], Rousseau, David [2], Chapeau-Blondeau, François [3]
Type	Article scientifique dans une revue à comité de lecture
Année	2010
Langue	Anglais
Date	2010/06/01
Numéro	2
Pagination	197 - 211
Volume	21
Titre de la revue	Multidimensional Systems and Signal Processing
ISSN	0923-6082 / 1573-0824
Mots-clés	Artificial [4], circuits [5], color [6], Electrical [7], Fractal [8], Multicomponent [9], Scaling [10], Signal, Image and Speech Processing [11], Three-dimensional [12]
Résumé en anglais	To contribute to the important task of characterizing the complex multidimensional structure of natural images, a fractal characterization is proposed for the colorimetric organization of natural color images. This is realized from their three-dimensional RGB color histogram, by applying a box-counting procedure to assess the dimensionality of its support. Regular scaling emerges, almost linear over the whole range of accessible scales, and with non-integer slope in log-log allowing the definition of a capacity dimension for the histogram. This manifests a fractal colorimetric organization with a self-similar structure of the color palette typically composing natural images. Such a fractal characterization complements other previously known fractal properties of natural images, some reported recently in their colorimetric organization, and others reported more classically in their spatial organization. Such fractal multiscale features uncovered in natural images provide helpful clues relevant to image modeling, processing and visual perception.
URL de la notice	http://okina.univ-angers.fr/publications/ua1408 [13]
DOI	10.1007/s11045-009-0097-0 [14]
Lien vers le document	http://dx.doi.org/10.1007/s11045-009-0097-0 [14]

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