{tag}

{/tag} International Journal of <u>Computer Applications</u> © 2014 by IJCA Journal

Volume 106 - Number 11

Year of Publication: 2014

Authors:

Dao Nam Anh

10.5120/18566-9818

{bibtex}pxc3899818.bib{/bibtex}

## Abstract

Using local or non-local features has proven to be a competent approach for denoising images. As noise and edges have similar effect of changes in gradient in many cases, noise allocation for denoising is still significant challenge. This work addresses the classic problem but introducing the combination concept of local and non-local factors with deviation refinement procedure. A new algorithm of the concept is proposed to ameliorate noise reduction. Sensitivity of noise detection is examined by iterative non-local mean and bilateral filter with refinement of range deviation. The final methodology is tested with Gaussian noise and compared with both non-local mean, bilateral filter. Experiment demonstrates improvement of denoising level in the new algorithm.

Refer

## ences

- P. Arias, V. Caselles, G. Facciolo, Analysis of a Variational Framework for Exemplar-Based Image Inpainting.

- L. P. Yaroslavsky, Digital Picture Processing - An Introduction, Springer Verlag, 1985.

- A. A. Efros and T. K. Leung. Texture synthesis by non-parametric sampling. In Proc. of the IEEE Conf. on CVPR, pages 1033–1038, Corfu, Greece, 1999.

- J. S. Lee, Digital image smoothing and the sigma filter, Computer Vision, Graphics and Image Processing, vol. 24, pp. 255-269, 1983.

- Pablo Arias, Vicent Caselles, and Guillermo Sapiro, A Variational Framework for Non-local Image Inpainting.

- Steffen Börm, Efficient Numerical Methods for Non-local Operators: H2-Matrix Compression, Algorithms and Analysis, EMS Tracts in Mathematics, 2010; 441 pp.

- Wong, A., Orchard, J., A nonlocal-means approach to exemplar-based inpainting, Browse Conference Publications, Image Processing, 2008. ICIP.

- C. Tomasi and R. Manduchi. Bilateral filtering for gray and color images. In Proc. of the Sixth International Conference on Computer Vision, Bombay, India, 1998.

- Sylvain Paris and Fredo Durand, A Fast Approximation of the Bilateral Filter using a Signal Processing Approach, CSAIL, MIT, 2006.

- S. Paris, P. Kornprobst, J. Tumblin and F. Durand, Bilateral Filtering: Theory and Applications in Computer Graphics and Vision Vol 4, No. 1 (2008).

- C. Kervrann and J. Boulanger, Optimal Spatial Adaptation for Patch-based Image Denoising, IEEE Trans. on Image Processing 15(10) 2866-2878 (2006).

- L. Rudin, S. Osher, and E. Fatemi, Nonlinear total variation based noise removal algorithms, Phys. D, 1992.

- Kwok-Wai Hung and Wan-Chi Siu, Real time interpolation using Bilateral filter for Image zoom or Video up-scaling/transcoding, ICCE 2012, pp. 67-68.

- A Alonso-González, C López-Martínez, P Salembier, X Deng, Bilateral Distance Based Filtering for Polarimetric SAR Data, Remote Sensing 5 (11), 5620-5641, 2013

- M. Lindenbaum, M. Fischer, and A. M. Bruckstein, On Gabor's contribution to image enhancement, Pattern Recognition, 27 (1994), pp. 1–8.

- A. Buades, B. Coll and J. M. Morel, A non-local algorithm for image denoising, IEEE Int. Conf. on Computer Vision and Pattern Recognition, 2005.

- A. Buades, B. Coll, J. M Morel, Nonlocal Image and Movie Denoising, International Journal of Computer Vision, Vol 76 (2), pp: 123-139, 2008.

- M. Zhang, B. K. Gunturk, Multiresolution Bilateral Filtering for Image Denoising, IEEE Trans. Image Process. Vol. 17 (2008), p. 2324.

- Gabriel Peyré, Toolbox of nlmeans.

Index Terms

Information Science

Computer Science

Keywords

Image denoising non-local mean bilateral filter noise deduction iterative filter.