Multidimensional Image Compression through Discrete Wavelet Transform in Matlab using Daubechies Wavelet

International Journal of Computer Applications
Foundation of Computer Science (FCS), NY, USA

Volume 178

Number 8

Year of Publication: 2019

Authors:

Nazir Jan, Nasruminallah, Rehmatullah

10.5120/ijca2019918778

Abstract

This research paper unveils the most powerful and latest tool for image compression; called Wavelet Transform (WT). WT avoids the blocking artifact of conventional DCT Transform. Fourier Transform is the famous transform but this transform always lost time information and preserves only frequency information. Wavelet Transform reserves the information of both time and frequency domains. WT is based on Function approximation or mathematical polynomials instead of blocks like DCT. Matlab simulations, in this research paper, shows much satisfying results and excellent compression ratio when applied on a multidimensional image using multiband Wavelet transform. Daubechies wavelet has been selected in the proposed research paper as analyzing signal.

References

1. Gonzalez, R. C. and Woods, E. R. January 2002. Digital Image Processing (2nd Edition). Prentice Hall.
2. Mallat, S. G. July 1989. A theory for multiresolution signal decomposition: the wavelet representation. vol. 11, pp. 674–693,
3. Shapiro, J. M. Dec 1993. Embedded image coding using zerotrees of wavelet coefficients. vol. 41, pp. 3445–3462,
4. Zhang, Y. S. 2008. Multiresolution analysis for image by generalized 2-d wavelets. Master’s thesis,
5. Daubechies, I. 1992. Ten lectures on wavelets, CBMS-NSF Regional Conference Series in Applied Mathematics. Philadelphia, PA: Society for Industrial and Applied Mathematics (SIAM). vol. 61.
6. Taubman, D. Oct. 24–28, 1999. High performance scalable image compression with ebcot. International Conference on Image Processing ICIP 99, vol. 3, pp. 344–348,
7. Mallat, S. December 2008. A Wavelet Tour of Signal Processing, 3rd ed., Third Edition: The Sparse Way. Academic Press, 3 ed.

Index Terms

Computer Science Image Processing

Keywords

Daubechies Wavelet, Multiband multidimensional image compression, multimedia data, Wavelet Transform