Abstract

A suggested approach is presented in this paper to obtain high-resolution images from the fusion and then interpolation of Magnetic Resonance (MR) and Computed Tomography (CT) images. MR and CT images are fused with either the Discrete Wavelet Transform (DWT) or the curvelet transform. After that, a least-squares interpolation step is carried out on the wavelet sub-bands of the fusion result. Simulation results show the feasibility of the fusion process to obtain images with more details and the efficiency of interpolation to obtain high-resolution images.
Least-Squares Interpolation of Fused MR and CT Images in the Wavelet Domain

References

- J. L. Starck, E. Candès, and D. L. Donoho, "The curvelet transform for image
  - G. Y. Chen and B. Kegl, "Image denoising with complex ridgelets," Pattern
  - J. -L. Starck, P. Abrial, Y. Moudden, and M. K. Nguyen, "Wavelets, ridgelets and
  - F. E. Ali, I. M. El-Dokany, A. A. Saad, and F. E. Abd El-Samie, "Curvelet
  - C. Chao and J. Tao, "Study of image magnification based on curvelet
   International Archives of the Photogrammetry, Remote Sensing, and Spatial Information
   Sciences (International Society for Photogrammetry and Remote Sensing, 2008), Vol. 37-B2,
   pp. 289–292.
  - J. Nunez, X. Otazu, O. Fors, A. Prades, V. Pala, and R. Arbiol,
   "Multi-resolution-based image fusion with additive wavelet decomposition," IEEE
  - B. B. Saevarsson, J. R. Sveinsson, and J. A. Benediktsson, "Combined wavelet
   and curvelet denoising of SAR images," in IEEE International Geoscience and Remote
  - S. E. El-Khamy, M. M. Hadhoud, M. I. Dessouky, B. M. Salam, and F. E. Abd
   of Information Acquisition (IJIA), March 2005.
  - T. Kratochvil and P. Simicek, "Utilization of MATLAB for picture quality
   evaluation," (Institute of Radio Electronics, Brno University of Technology, 2005).

Index Terms

Computer Science  Algorithm

Keywords

Image interpolation  Image fusion  and Curvelet transform