Abstract

Enhancing the quality of image is a continuous process in image processing related research activities. For some applications it becomes essential to have best quality of image such as in forensic department, where in order to retrieve maximum possible information, image has to be enlarged in terms of size, with higher resolution and other features associated with it. Such obtained high quality images have also a concern in satellite imaging, medical science, High Definition Television (HDTV), etc. In this paper a novel approach of getting high resolution image from a single low resolution image is discussed. The Non Sub-sampled Contourlet Transform (NSCT) based learning is used to learn the NSCT coefficients at the finer scale of the unknown high-resolution image from a dataset of high resolution images. The cost function consisting of a data fitting term and a Gabor prior term is optimized using an Iterative Back Projection (IBP). By making use of directional decomposition property of the NSCT and the Gabor filter bank with various orientations, the proposed method is capable to reconstruct an image with less edge artifacts. The validity of the proposed approach is proven through simulation on several images. RMS measures, PSNR measures and illustrations show the success of the proposed method.


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Index Terms

Computer Science
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Keywords

Super-resolution  Non Sub-Sampled Contourlet Transform  Gabor filter bank