Image fusion and denoising have been widely researched as separate techniques for the past few decades. Most of the fusion techniques fuse the images with the assumption that images are non-noisy. But in many practical applications, especially, in the case of satellite images this assumption fails. In this paper, a novel technique based on nonlocal means filter in conjunction with multiresolution contourlet transform for simultaneous image denoising and fusion is proposed. Recently developed shrinkage technique is used at the detail coefficients for the purpose of denoising. A change in the multiresolution framework is proposed by applying a nonlocal means filter at the approximate coefficients that further reduces the effect of noise. The process of image fusion is carried out in the multiresolution framework by applying suitable fusion rule. Advantages of simultaneous denoising and fusion technique has been demonstrated qualitatively and quantitatively with a wide number of quality metrics.

References


Index Terms

Computer Science

Image Processing

Keywords

nonlocal means contourlet transform fusion shrinkage