

1062-15-161

Bruce W Suter* (bruce.suter@rl.af.mil), AFRL/RITB, 525 Brooks Road, Rome, NY 13441,
and **Lixin Shen**. *Deblurring Images Contaminated with Spatially-Varying Noise*.

We will discuss a problem of image restoration using images that are contaminated by spatially varying noise. Existing methods for image restoration problem are based on minimizing an objective functional having the L1 fidelity term and the Mumford-Shah regularizer. We present a new algorithm on this problem by minimizing a new objective functional. The proposed functional has a content dependent fidelity term which assimilates the strength of fidelity terms measured by the L1 and L2 norms. The regularizer in the functional is formed by the L1 norm of tight framelet coefficients of the underlying image. We then present an iterative framelet based approximation/sparsity deblurring algorithm (IFASDA) for the proposed functional. Parameters in IFASDA are adaptively varying at each iteration and are determined automatically. In this sense, IFASDA is a parameter-free algorithm. This advantage makes the algorithm more attractive and practical. The effectiveness of IFASDA is experimentally illustrated on problems of image deblurring with Gaussian and impulse noise. Improvements in both PSNR and visual quality of IFASDA over a typical existing method are demonstrated. (Received August 05, 2010)