

Simultaneous Superresolution and Blind Deconvolution

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Abstract

In many real applications, blur in input low-resolution images is a nuisance, which prevents traditional superresolution methods from working correctly. Only integer resolution enhancement factors, such as two or three, are often considered, but non-integer factors between one and two are also important in real cases. We introduce a method to superresolution and deconvolution, which assumes no prior information about the shape of degradation blurs and which is properly defined for any rational (fractional) resolution factor. The method minimizes a regularized energy function with respect to the high-resolution image and blurs, where regularization is carried out in both the image and blur domains. The blur regularization is based on a generalized multichannel blind deconvolution constraint. Experiments on real data illustrate robustness to noise and other advantages of the method.