Reduction of intensity bias via iterative reweighted TV regularization

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Total variation (TV) regularization has become a popular approach to image restoration in many applications, in part because of its edge-preserving properties. However, TV regularization is also known to be scale-dependent, a property that often leads to biased intensities and excessive loss of smaller-scaled features in a TV-based reconstruction. This is problematic in applications where the pixel or voxel intensities carry important information.

In this talk, we discuss an iterative reweighed TV regularization method that reduces both the intensity bias and the loss of smaller-scaled features while preserving edges in the reconstruction. We also compare our method to standard TV-reconstruction and filtered back-projection based on a numerical study of examples in tomography.

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