RECENT ADVANCES IN ITERATIVE SHRINKAGE/THRESHOLDING

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Iterative shrinkage/thresholding (IST) algorithms are an important component of the computational toolbox used in image restoration/reconstruction problems under non-quadratic regularization (e.g., total-variation, wavelet-based). IST algorithms are typically used to address unconstrained minimization formulations, where the objective function includes a linear-quadratic data term (corresponding to a linear observation operator followed by additive Gaussian noise) and a sparsity-inducing regularizer (typically the p-th power of an ℓ_p norm). In the first part of this talk, we will briefly review the several ways in which IST algorithms can be derived (expectation-maximization [1], majorization-minimization [2], forward-backward splitting [3], separable approximation [4]) as well as several convergence results. We will then present some recent advances : (a) new ways to derive fast IST-like algorithms for deconvolution, (b) new IST-type algorithms for non-Gaussian noise (namely Gamma and Poisson, which are common in remote sensing and medical imaging).

References

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