Software to accompany the paper:

I. Selesnick, 'Sparsity amplified', IEEE Int. Conf. Acoust., Speech, Signal Processing (ICASSP), Mar. 2017.

Abstract: The L1 norm is often used as a penalty function to obtain a sparse approximate solution to a system of linear equations, but it often underestimates the true values. This paper proposes a different type of penalty that (1) estimates sparse solutions more accurately and (2) maintains the convexity of the cost function. The new penalty is a multivariate generalization of the minimax-concave (MC) penalty. To define the generalized MC (GMC) penalty we first define a multivariate generalized Huber function. The resulting cost function can be minimized by proximal algorithms comprising simple computations. The effectiveness of the GMC penalty is illustrated in a denoising example.

Program listing

srls_GMC
: Sparse-regularized least squares (srls) using the proposed GMC penalty.

srls_L1
: Sparse-regularized least squares (srls) using the L1 norm

GMC_demo
: Demonstration (example from paper) of signal denoising based on frequency-domain sparsity

huber_1d_demo
: Shows one-dimensional Huber function and MC penalty

huber_2d_demo
: Shows proposed two-dimensional generalized Huber function and generalized MC penalty

huber_2d
: Calculates two-dimensional generalized Huber function

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March 18, 2017