

Overlapping Thresholding for Group-Sparse Signal Denoising

Group-Sparse Signal Denoising: Non-Convex Regularization, Convex Optimization

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Preprint: <http://arxiv.org/abs/1308.5038>

Web: <http://eeweb.poly.edu/iselesni/ncogs/>

Software version: 6.2

This algorithm performs group-sparse thresholding. The algorithm is intended for denoising signals that possess a group sparse structure. The approach is based on overlapping group sparsity (OGS). Although the regularizer is non-convex, it is designed such that the total cost function is convex. The comparison to convex-regularized OGS demonstrates the improvement obtained by non-convex regularization.

Matlab programs for non-convex OGS

- [ogs1.m](#) OGS for 1D signals
- [ogs2.m](#) OGS for 2D signals
- [ogs3.m](#) OGS for 3D signals

Demos in Matlab

- [demo 1](#) Group-sparse thresholding using 1D OGS
- [demo 2](#) Group-sparse thresholding using 2D OGS
- [demo 3](#) Group-sparse thresholding using 3D OGS

Examples from paper

- [Example 1](#) Signal denoising using 1D OGS (example from the paper)
- [Example 2](#) Speech enhancement using 2D OGS in time-frequency (spectrogram) domain.

Notes

- The recommended regularizers are 'atan' and 'mcp'. The 'mcp' regularizer is described in the paper: C.-H. Zhang, 'Nearly unbiased variable selection under minimax concave penalty,' The Annals of Statistics, pages 894-942, 2010.

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