

The PSALM: Hyperparameter-Free Regularization in High-Dimensional Sparse Regression Models

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Abstract

The PSALM estimator, a novel regularization scheme for sparse model estimation in potentially high-dimensional settings, is developed. The main feature of the PSALM is that it mimics the behavior and performance of the LASSO without requiring the user to set the value of a regularization hyperparameter. In particular, the PSALM performs variable selection based on soft-thresholding of the least squares estimator, and satisfies an identical prediction norm bound up to a multiplicative constant. Desparsification and post-selection estimation are proposed as inference procedures. Applications to synthetic as well as real data are presented.