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The LASSO for generic design matrices as a function of the relaxation parameter

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(Submitted on 7 May 2011)

The LASSO is a variable subset selection procedure in statistical linear regression based on ℓ_1 penalization of the least-squares operator. Its behavior crucially depends, both in practice and in theory, on the ratio between the fidelity term and the penalty term. We provide a detailed analysis of the fidelity vs. penalty ratio as a function of the relaxation parameter. Our study is based on a general position condition on the design matrix which holds with probability one for most experimental models. Along the way, the proofs of some well known basic properties of the LASSO are provided from this new generic point of view.

Submission history

From: Stephane Chretien [view email]
[v1] Sat, 7 May 2011 09:56:49 GMT (16kb)

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