Bayesian Modeling of Sparse High Dimensional Data using Divergence Measures

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Abstract

We introduce a novel divergence based approach, called Bregman divergence, to
model sparse high dimensional problems. We also introduce a new prior which in-
duces a new version of the (approximate) adaptive lasso in a Bayesian framework.
Unlike the original adaptive lasso in which the weights should be pre-specified prior
to the estimation, in our approach the coefficient estimates are directly used as the
weights. In addition, due to the generality of the Bregman divergence, the proposed
model is easily extended to generalized linear models as well as the group lasso.

Keywords: Bayesian lasso; Bregman divergence; GD prior; Sparse high dimensional data.