

USC Department of Mathematics
PROBABILITY & STATISTICS SEMINAR

3:30 PM, Friday 21.Nov.08
249 Kaprielian Hall
(Refreshments served at 3 PM)

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Forward-LASSO with Adaptive Shrinkage

Both classical Forward Selection and the more modern Lasso provide computationally feasible methods for performing variable selection in high dimensional regression problems involving many predictors. We note that although the Lasso is the solution to an optimization problem while Forward Selection is purely algorithmic, the two methods utilize surprisingly similar approaches. Both iteratively add to the model the variable which has the highest correlation with the residual vector, with the only difference being in the level of shrinkage applied. We propose a new method we call Forward-Lasso Adaptive SHrinkage (FLASH), which incorporates both Forward Selection and the Lasso as special cases. FLASH works well in situations where either Forward Selection or the Lasso dominates but also performs well in situations where neither method succeeds. FLASH is fitted using a variant of the computationally efficient LARS algorithm, and we prove that it can be formulated as the solution to a weighted Lasso optimization problem. We provide theoretical justifications and also demonstrate, on an extensive set of simulations and a real world data set, that FLASH generally outperforms many competing approaches.