Department of Mathematical Sciences Colloquium

Candidate for Tenure-Track Statistics Position in the Dept. of Mathematical Sciences

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Variable Selection via Subtle Uprooting

We propose a new variable selection method, termed subtle uprooting", for generalized linear models. In this method, a smoothed version of an information criterion is optimized, by approximating the $\ell 0$ norm of a parameter with a continuous unit dent function. The significance of this approach is that it achieves variable selection and parameter estimation in one step and avoids tuning penalty parameters in traditional regularization approaches. Moreover, two additional tactics, 'uprooting' and `ϵ-threshold', are put forward to modify the objective function in order to enforce sparsity in parameter estimates while maintaining its smoothness. The procedure results in an un-constrained nonconvex yet smooth programming problem. This setup allows us to borrow strength from established methods and theories in both optimization and statistical estimation. In particular, a BFGS algorithm with cautious update is adopted to solve the unconstrained non convex programming problem, with established global and super-linear convergence. The oracle and other asymptotic properties of the proposed method are also explored by making connections to M-estimators and information criteria. Both simulated experiments and empirical examples are provided to illustrate the method.

Wednesday April 17th, 2013 at 3 pm
In Bell Hall 130
The University of Texas at El Paso

Refreshments will be served 15 minutes prior to start of the colloquium

For further information, please contact Dr. Joan Staniswalis, 915-747-6761
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