## Sparse non-parametric Bayesian shrinkage for high dimensional problems

by

Vikas C. Raykar CAD and Knowledge Solutions (IKM CKS) Siemens Healthcare, Malvern, PA 19355 USA vikasraykar@gmail.com

## Abstract

We consider the problem of estimating independent normal means in a sparse scenario. A non-parametric empirical Bayesian approach is developed. The prior on each mean is a mixture of an atom of probability at zero and a *completely unspecified* density for the non-zero part. An iterative algorithm based on weighted non-parametric kernel density estimate is developed. The proposed method adapts well to the sparsity of the problem. We apply this procedure to two very important problems-feature selection and shrinkage for the high-dimensional  $(p \gg N)$  classification and multiple hypothesis testing scenario. Our simulation results show very promising results compared to the existing methods.

This is joint work with Linda Zhao, Department of Statistics, University of Pennsylvania, Philadelphia.