

Applied and Computational Mathematics and Statistics Colloquium

Ryan Martin

Department of Mathematical Sciences
Indiana University-Purdue University Indianapolis

will give a lecture entitled:

*Predictive Recursion Marginal Likelihood and Application to Large-Scale
Simultaneous Hypothesis Testing*

Friday, January 21st, 2011

4:00 PM

Location: 129 Hayes-Healy Center

Abstract:

Predictive recursion (PR) is an accurate and computationally efficient algorithm for nonparametric estimation of mixing densities. In semiparametric mixture models, however, PR fails to account for uncertainty in the structural parameter. In this talk I will describe how PR can be used as a filter approximation to fitting a fully Bayes Dirichlet process mixture model. From this connection to the Bayesian setup, a PR-based approximation of the marginal likelihood emerges that can be used for inference. Theory will be presented which says that a normalized version of the PRML acts asymptotically like an oracle model selector. As an application, I will consider the important problem of large-scale simultaneous hypothesis testing. In particular, I will introduce a flexible and identifiable version of the two-groups model, which is a special case of the general semiparametric mixture. PRML can then be used to estimate model parameters, and the tests are carried out in an empirical Bayes fashion. The method will be illustrated with two real microarray data sets.