

## **Test Error in Classification and Adaptive Oracle Classifiers**

**Joint work with Michael Kosorok**

The estimated test error of a learned classifier is the most commonly reported measure of classifier performance. Laber and Murphy (2011) used a non-regular framework to construct confidence intervals for the test error. Inspired by the framework studied by Laber and Murphy (2011), we propose a family of adaptive classifiers. We discuss briefly their asymptotic properties and show that under the non-regular framework these classifiers have an “oracle property”: the optimal classifier is correctly identified in probability that tends to one. Consequently, the classifiers have smaller asymptotic test error variance than those of the original classifier. We also show that confidence intervals for the test error of the adaptive classifiers, based on either normal approximation or centered percentile bootstrap, are consistent.