Meeting: 1000, Albuquerque, New Mexico, SS 15A, Special Session on Probabilistic and Geometric Methods in Learning Theory

1000-60-202 **Clint Scovel*** (jcs@lanl.gov), CCS-3, MS-B265, LANL, Los Alamos, NM 87545. *Anomaly Detection is Classification.*

One way to describe anomalies is by saying that anomalies are not concentrated. This leads to the problem of finding level sets for the data generating density. We interpret this learning problem as a binary classification problem and compare the corresponding classification risk with the standard performance measure for the density level problem. In particular it turns out that the empirical classification risk can serve as an empirical performance measure for the anomaly detection problem. This allows us to compare different anomaly detection algorithms *empirically*, i.e. with the help of a test set. Based on the above interpretation we then propose a support vector machine (SVM) for anomaly detection. We establish universal consistency for this SVM and under an additional "noise" assumption we establish rates. Finally we report some experiments which compare our SVM to other commonly used methods including the standard one-class SVM. (Received August 24, 2004)