

MATH 7740 - Statistical Learning Theory

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Learning theory has become an important topic in modern statistics. I intend to give an overview of various topics in classification, starting with Stone's (1977) stunning result that there are classifiers that are universally consistent.

Other topics include classification, plug-in methods (k-nearest neighbors), reject option, empirical risk minimization, VC theory, fast rates via Mammen and Tsybakov's margin condition, convex majorizing loss functions and support vector machines, lasso type estimators, low rank multivariate response regression, random matrix theory and current topics in high dimensional statistics.

Grading: Your grade will be based on homeworks and a final project. In addition, students are expected to summarize the material presented in class in LaTeX.

Prerequisites: mathematical statistics (MATH 6730 or equivalent) and measure theoretic probability (MATH 6710).

Suggested texts:

DEVROYE, L., GYORFI, L. and LUGOSI, G. (1996). A Probabilistic Theory of Pattern Recognition. Springer, New York.

GIRAUD, C. (2014). Introduction to High-Dimensional Statistics. Chapman & Hall.