

Tapan K. Nayak

Title: Some general theory of statistical prediction with applications.

We motivate prediction as a general statistical inference problem, covering estimation and many non-standard inference problems as special cases. In general, inferences are to be made about an unknown quantity  $y$  based on the observed value of a random vector  $X$ . The unknown quantity  $y$  may be fixed or the realized but unobserved value of a random variable  $Y$ . Assuming a parametric framework, we shall discuss some frequentist and decision theoretic results. We shall present lower bounds for the MSE of unbiased predictors and a characterization of uniformly minimum MSE unbiased predictors. We shall note some close connections between prediction and estimation and discuss some admissibility results. We shall apply the theoretical results to some specific problems, including prediction in mixed linear models and in finite population sampling.