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Testing for Additivity in Nonparametric Regression

In this talk I will discuss a novel approach for testing for additivity in nonparametric regression. We represent the model using a linear mixed model framework and equivalently re-write the original testing problem as testing for a subset of zero variance components. We propose two testing procedures: the restricted likelihood ratio test and the generalized F test. We develop the finite sample null distribution of the restricted likelihood ratio testing and generalized F test using the spectral decomposition of the restricted likelihood ratio and the residual sum of squares, respectively. Numerical investigation shows that the proposed testing procedures overperform the available methods for both fixed and random designs in terms of size and power.