A General Test for Functional Inequalities

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This paper develops a nonparametric test for general functional inequalities that include conditional moment inequalities as a special case. It is shown that the test controls size uniformly over a large class of distributions for observed data, importantly allowing for general forms of time series dependence. New results on uniform growing dimensional Gaussian coupling for general mixingale processes are developed for this purpose, which readily accommodate most applications in economics and finance. The proposed method is applied in a portfolio evaluation context to test for "all-weather" portfolios with uniformly superior conditional Sharpe ratio functions.