

Department of Mathematics and Statistics Colloquium

Cooking The Books For Fun And Profit?

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Abstract: Nearly a century ago Neyman & Pearson showed that test-statistics with monotone likelihood ratio functions yield uniformly most powerful parametric tests, pretty much closing the book on testing theory. Unfortunately, data analysts have since struggled with the discrepancy between one-sided and two-sided test assessment measures. I explain how this discrepancy arises from using marginal probabilities to assess Type I Error risk. I argue that risk of error exists only if empirical data support the alternative hypothesis, so that probabilities conditioned upon this empirical support are much more appropriate measures of error risk. As data-dependent procedures are anathema, however, my key result is showing that the monotonic likelihood ratios that Neyman & Pearson used to develop optimal tests further have the felicitous benefit of uniformly bounding conditional probabilities of Type I Errors, making these conditional probabilities far better test assessment measures.

Monday, October 30 at 3:50 in Roop 103

Refreshments at 3:30