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Title: Data-driven hypothesis weighting for false discovery rate control

Abstract:

Hypothesis weighting is a powerful approach for improving the power of data analyses that employ multiple testing. However, in general it is not evident how to choose the weights. I will describe IHW, a method for data-driven hypothesis weighting that makes use of informative covariates that are independent of the test statistic under the null, but informative of each test’s power or prior probability of the null hypothesis. Covariates can be continuous or categorical and need not fulfill any particular assumptions. The method increases statistical power in applications while controlling the false discovery rate (FDR) throughout extensive simulations, and produces additional insight by revealing the covariate-weight relationship. Independent hypothesis weighting is a practical approach to discovery of associations in large datasets.

Parts of this talk are expanded in the preprint: “Data-driven hypothesis weighting increases detection power in big data analytics,” by Nikolaos Ignatiadis, Bernd Klaus, Judith Zaugg, and Wolfgang Huber. http://dx.doi.org/10.1101/034330