THE UNIVERSITY OF CHICAGO

COMPUTATIONAL AND APPLIED MATHEMATICS
STUDENT SEMINAR

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A Frequentist Perspective on the Local False Discovery Rate

Tuesday, March 8, 1:30-2:30pm
Jones Laboratory, Room 303

ABSTRACT

Defined with an assumption that hypotheses are random, the two-groups model (Efron et al., 2001) provides a Bayesian framework for thinking about testing multiple hypotheses. Remarkably, procedures motivated within this framework can also have desirable frequentist properties, such as FDR control for fixed configurations of hypotheses. We argue that in the absence of the Bayesian assumption, procedures that optimize an economic cost-to-benefits trade-off have targeted a frequentist local false discovery rate (flfdr), defined here as the long-run frequency that a selected hypothesis is null, in a sequence of repeated multiple testing experiments. We show that the flfdr is controlled in finite samples by a conservative modification to the procedure of Benjamini and Hochberg (1995) for independent p-values that are uniform under the null, and quantify the rate at which the rejection region of this procedure approaches a limiting level-set of the flfdr.