



THE UNIVERSITY OF
CHICAGO

DEPARTMENT OF STATISTICS

Statistics Colloquium

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“Bringing closure to FDR control: a general principle for multiple testing”

Monday November 17, 2025, at 11:30 AM

Jones 303, 5747 S. Ellis Avenue

Pre-Seminar refreshments will be served in Jones 303 at 11:00 am

Abstract

The closure principle (Biometrika'76) states that *every procedure for controlling the familywise error rate (FWER) can be recovered or improved via "closed testing"*. Since the publication of the seminal Benjamini-Hochberg paper (the most cited paper in statistics), it has been an open problem how the "closure principle" applies to controlling the false discovery rate (FDR). We fully settle this open problem by developing a closure principle not only for FDR, but every error metric that is an expectation (including the classical one for FWER as a special case). Our developments crucially hinge on the modern concept of e-values, which perhaps explains the delay in its discovery. This theoretical advance has immediate implications for practice: it leads to surprising improvements to both modern and classical FDR methods (eg: Benjamini-Yekutieli's famous 2001 procedure is strictly improved, as is the e-Benjamini-Hochberg procedure), and it also allows for practitioners to choose the error metric and error level post-hoc.

<https://arxiv.org/abs/2509.02517> is the preprint, joint work with Ziyu Xu, Aldo Solari, Lasse Fischer, Rianne de Heide, Jelle Goeman (it is actually a merge of two simultaneous papers).