

# 中央研究院統計科學研究所

## 學術演講

講題：Optimal shrinkage estimation in heteroscedastic hierarchical models: beyond empirical Bayes

演講人：Prof. Samuel Kou (寇星昌教授)

Department of Statistics, Harvard University

時間：2024-06-20(Thu) 10:30-12:00

地點：Auditorium, B1F, Institute of Statistical Science; The tea reception will be held at 10:10.

備註：Online live streaming through Cisco Webex will be available.

### Abstract

Hierarchical models are powerful statistical tools widely used in scientific and engineering applications. The homoscedastic (equal variance) case has been extensively studied, and it is well known that shrinkage estimates, the James-Stein estimate in particular, offer nice theoretical (e.g., risk) properties. The heteroscedastic (the unequal variance) case, on the other hand, has received less attention, even though it frequently appears in real applications. It is not universally accepted of how to construct "optimal" shrinkage estimate. In this talk, we study this problem. In particular, we consider hierarchical linear models and models beyond Gaussian. We introduce a class of shrinkage estimates, constructed by minimizing an unbiased risk statistic. We show that this class is asymptotically optimal in the heteroscedastic case. We apply the estimates to real examples and observe competitive numerical results.



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