



香港中文大學統計學系

Department of Statistics

THE CHINESE UNIVERSITY OF HONG KONG

# SEMINAR

DEPARTMENT OF STATISTICS  
THE CHINESE UNIVERSITY OF HONG KONG

## Monotone Response Surface of Multi-factor Condition: Estimation and Bayes Classifiers

### INVITED SPEAKER

Ying Kuen Cheung

Professor

Department of Biostatistics

University of Columbia

### TIME

July 04, 2023 (Tue) · 2:30 pm - 3:30 pm

### VENUE

LT2 · Lady Shaw Building · CUHK

### ABSTRACT

We formulate the estimation of monotone response surface of multiple factors as the inverse of an iteration of partially ordered classifier ensembles. Each ensemble (called product-of-independent-probability-escalation (PIPE)-classifiers) is a projection of Bayes classifiers on the constrained space. We prove that the inverse of PIPE-classifiers (iPIPE) exists, and propose algorithms to efficiently compute iPIPE by reducing the space over which optimisation is conducted. The methods are applied in analysis and simulation settings where the surface dimension is higher than what the isotonic regression literature typically considers. Simulation shows that iPIPE-based credible intervals achieve nominal coverage probability and are more precise compared to unconstrained estimation.