



統計科學研究所

INSTITUTE OF  
STATISTICAL SCIENCE



統計所學術演講



中研院統計所

## 學 術 演 講

講 題：Multi-fidelity surrogate modeling with confidence: stacking experimental design with cost complexity guarantees

演講人：宋治立 教授

(Department of Statistics and Probability,  
Michigan State University, USA)

時 間：2022年7月4日(星期一)，10:30-12:00

地 點：中央研究院統計科學研究所 B1F 演講廳

### Abstract

In an era where scientific experimentation is costly, multi-fidelity emulation (i.e., predictive modeling using data of multiple fidelities, or accuracies) is becoming a crucial tool for scientific discovery. Such emulators allow experimenters to maximize predictive power and thus scientific inference given an experimental budget. There has, however, been little work exploring the problems of design and sample size determination for multi-fidelity emulation, both of which are critical for cost-efficient predictive modeling. We thus propose a novel experimental design framework which addresses both problems under a novel multi-level emulator model. We prove a novel complexity theorem which shows, under the proposed sequential design, the resulting emulator achieves a prediction accuracy given a computational cost. We then demonstrate the effectiveness of the proposed sequential design in a suite of simulation experiments and an application to finite-element analysis.

※ 茶 會：上午10：10開始

※ 英文演講，實體與線上視訊同步進行

