Seminar

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

Speaker：Prof. Chih-Li Sung

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Time：10:30 AM~12:00 PM, Monday, July 4, 2022

Place：Auditorium, B1F, Institute of Statistical Science, Academia Sinica.

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.

※ Tea reception starts at 10:10 AM.
※ Lecture in English. Online live streaming through Microsoft Teams will be available.