

MICHIGAN STATE UNIVERSITY
Department of Statistics and Probability

COLLOQUIUM

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Applications of Computer Experiments: Emulation and Calibration

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10:20 AM - 11:10 AM

Refreshments 10:00 AM

C405 Wells Hall

Abstract

In this talk, two applications of computer experiments will be introduced: emulation and calibration. In the first part of the talk, a cluster Gaussian process model will be introduced that serves as an emulation alternative for computer experiments. Unlike the traditional emulation method, which is the Gaussian process approximation, the cluster Gaussian process enjoys computational advantages and tackles the nonstationarity limitations of traditional Gaussian processes. In the second part of the talk, a real calibration problem for plant growth computer models will be introduced. Computer models often involve some unknown parameters, and estimating the parameters by collecting physical data becomes essential in many scientific fields, ranging from engineering to biology. In this application where replicates in the physical experiment are available, a new calibration method for the physical data with heteroscedastic measurement errors will be introduced. Empirical results show that this approach can be used to produce more statistically robust conclusions from computer models of biology and biochemistry in general.

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