

STAT 280B-01: Seminars in Statistics on Oct-7th, 2019 (Monday 4pm in Engineering 2, Room 192)

Speaker: Jianguo Huang, Visiting Assistant Professor of Statistics, UC Santa Cruz

Title: On-site surrogates for large-scale calibration

Abstract: Motivated by a computer model calibration problem from the oil and gas industry, involving the design of a honeycomb seal, we develop a new Bayesian methodology to cope with limitations in the canonical apparatus stemming from several factors. We propose a new strategy of on-site design and surrogate modeling for a computer simulator acting on a high-dimensional input space that, although relatively speedy, is prone to numerical instabilities, missing data, and nonstationary dynamics. Our aim is to strike a balance between data-faithful modeling and computational tractability in a calibration framework---tailoring the computer model to a limited field experiment. Situating our on-site surrogates within the canonical calibration apparatus requires updates to that framework. We describe a novel yet intuitive Bayesian setup that carefully decomposes otherwise prohibitively large matrices by exploiting the sparse blockwise structure. Empirical illustrations demonstrate that this approach performs well on toy data and our motivating honeycomb example.