

Speaker: Derek Bingham, Simon Fraser University

Title: Efficient Emulators of Computer Experiments Using Compactly Supported Correlation Functions

Date: Wednesday, August 26, 2009

Time: **11 a.m.**

Location: **TA 3, Building 40, Room N125 (Moon Room)**

Abstract:

Statistical emulators of computer simulators have proven to be useful in a variety of applications. The widely adopted model for building these emulators, using a Gaussian process distribution with strictly positive correlation function, can be computationally intractable when the number of evaluated input values is large. We propose new methodology that uses a combination of low-order regression terms and compactly supported correlation functions to recreate the desired predictive behavior of the simulator at a fraction of the computational cost. Following the usual approach of taking the correlation to be a product of correlations in each input dimension, we show how to impose restrictions on the range of each correlation, giving sparsity, while also allowing the ranges to trade off against one another, thereby giving good predictive performance when the data are non-isotropic. We illustrate the method using data from a computer simulator of photometric red-shift. This is joint work with Cari Kaufmann (UC Berkeley), Salman Habib and Katrin Heitmann (LANL).

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