

Stanford University
Department of Statistics

DEPARTMENTAL SEMINAR

4:30pm, Tuesday, April 16, 2019

*** New Venue ***

Mechanical Engineering (02-530) Room 127

Refreshments served at 4pm in Sequoia Lounge.

Speaker: Pierre E. Jacob, *Harvard University*

Title: Unbiased Markov chain Monte Carlo methods

Abstract:

Monte Carlo estimators, based on Markov chains or interacting particle systems, are typically biased when run with a finite number of iterations (or a finite number of particles). Although this is usually considered unavoidable, and negligible in the usual asymptotic sense, it is an important obstacle on the path towards scalable numerical integration on large-scale computers. In a series of works that build on the seminal paper of Glynn and Rhee (2014), a number of collaborators and I construct couplings of Markov chains that lead to unbiased estimators that can be computed in a finite (random) cost. I will describe the construction for some MCMC algorithms (Metropolis-Hastings, Gibbs, Hamiltonian Monte Carlo). I will then describe how particle methods (annealed importance samplers, sequential Monte Carlo samplers) can be “de-biased” as well in a generic way. Beyond the main motivation for parallel algorithms and if time permits, I will also mention different tasks that can benefit from unbiased Monte Carlo estimators, such as modularized Bayesian inference, normalizing constant estimation, and Bayesian cross-validation.