THE UNIVERSITY OF CHICAGO

Departments of Computer Science, Mathematics, Statistics and the Computation Institute

SCIENTIFIC AND STATISTICAL COMPUTING SEMINAR

NAWAF BOU-RABEE
Mathematical Sciences Department
Rutgers University, Camden

Simple Ergodic Variants of the Hamiltonian Monte Carlo Method

THURSDAY, November 10, 2016 at 4:00 PM
226 Jones Laboratory, 5747 S. Ellis Avenue
Host: Jonathan Weare

ABSTRACT

The Hamiltonian (or Hybrid) Monte Carlo (HMC) method is a Markov Chain Monte Carlo technique that uses proposal moves computed with the help of an auxiliary Hamiltonian dynamics. It offers the potential of generating proposals that are far away from the current location of the chain and, at the same time, may be accepted with high probability. Unfortunately, the success of the method depends on choosing appropriately the values of two parameters: the duration of the Hamiltonian flow and the time-step of the numerical integrator. For some unfortunate values of the parameters, the method may perform poorly or even not be ergodic. We shall present simple variants of the standard HMC method that may be rigorously proved to be geometrically ergodic regardless of the choice of the parameter values. This is joint work with J. M. Sanz-Serna (UC3M).