THE UNIVERSITY OF CHICAGO

Department of Statistics
MASTER'S THESIS PRESENTATION

JUN JIE CHOO

Department of Statistics
The University of Chicago

The No-U-Turn Sampler: Adaptively Setting Path Lengths in Hamiltonian Monte Carlo

MONDAY, February 22, 2021, at 9:45AM
ZOOM Meeting

ABSTRACT

Hamiltonian Monte Carlo (HMC) is a Markov chain Monte Carlo (MCMC) method that is able to effectively sample high dimensional target distributions by using Hamilton's equations to design a proposal mechanism that exploits the target geometry. However, HMC's performance is highly sensitive to tuning parameters. The No-U-Turn Sampler (NUTS) eliminates the need to hand-tune parameters, whilst showing a competitive performance when compared with a well tuned vanilla HMC. This thesis will provide a background introduction to HMC and describe in detail the NUTS algorithm. Several numerical simulations will illustrate the flexibility of the NUTS algorithm and its practical advantage over vanilla HMC.