ICTS - OT/ML/PDE Seminar

Title : MCMC Importance Sampling via Moreau-Yosida Envelopes

Speaker : Dootika Vats (Indian Institute of Technology, Kanpur)

Date : Tuesday, 25 February 2025

Time : 4:00 PM (IST)

Abstract : Markov chain Monte Carlo (MCMC) is the workhorse computational algorithm employed for inference in Bayesian statistics. Gradient-based MCMC algorithms are known to yield faster converging Markov chains. In modern parsimonious models, the use of non-differentiable priors is fairly standard, yielding non-differentiable posteriors. Without differentiability, gradient-based MCMC algorithms cannot be employed effectively. Recently proposed proximal MCMC approaches, however, can partially remedy this limitation. These approaches employ the Moreau-Yosida (MY) envelope to smooth the nondifferentiable prior enabling sampling from an approximation to the target posterior. In this work, we leverage properties of the MY envelope to construct an importance sampling paradigm to correct for this approximation error. We establish asymptotic normality of the importance sampling estimators with an explicit expression for the asymptotic variance which we use to derive a practical metric of sampling efficiency. Numerical studies show that the proposed scheme can yield lower variance estimators compared to existing proximal MCMC alternatives.

Venue : Online
Zoom Link: https://us02web.zoom.us/j/81379290349
Meeting ID: 813 7929 0349