



QMC Opening Workshop August 28-September 1, 2017

Lecture: *Deterministic Sampling for Bayesian Computation*

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Abstract:

Markov chain Monte Carlo (MCMC) methods are popularly used in Bayesian computation. However, they need large number of samples for convergence which can become costly when the posterior distribution is expensive to evaluate. Deterministic sampling techniques such as Quasi-Monte Carlo (QMC) can be a useful alternative to MCMC, but the existing QMC methods are mainly developed only for sampling from unit hypercubes. Unfortunately, the posterior distributions can be highly correlated and nonlinear making them occupy very little space inside a hypercube. Thus, most of the samples from QMC can get wasted. The QMC samples can be saved if they can be pulled towards the high probability regions of the posterior distribution using inverse probability transforms. But this can be done only when the distribution function is known, which is rarely the case in Bayesian problems. In this talk, I will discuss a deterministic sampling technique, known as minimum energy designs, which can directly sample from the posterior distributions.