Department of Decision Sciences

Statistics Seminar

Reduced variance Monte Carlo for Bayesian models with intractable likelihoods

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12:30pm Room 3-E4-SR03 Via Rontgen 1 Milano

Abstract

Many statistical models are intractable, in the sense that the likelihood function cannot easily be evaluated, even up to proportionality. Bayesian estimation in this setting remains challenging. In this paper we construct novel control variates for intractable likelihoods that can reduce the Monte Carlo variance of Bayesian estimators, in some cases dramatically. We prove that our control variates are well-defined, provide a positive variance reduction and derive optimal tuning parameters that are targeted at maximising this variance reduction. Moreover, the methodology is highly parallelisable and offers an alternative route to exploit multi-core processing architectures for Bayesian computation. We illustrate the performance of our methodology on a variety of problems.