Thursday 11 January 2018
16h30 – 18h00
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Novel Importance Sampling Techniques for Bayesian Inference

Abstract: Importance Sampling methods are broadly used to approximate posterior distributions in the context of Bayesian inference. In its standard approach, samples are drawn from a single proposal distribution and weighted properly. However, since the performance depends on the mismatch between the targeted and the proposal distributions, several proposal densities are often employed for the generation of samples. Under this Multiple Importance Sampling (MIS) scenario, many works have addressed the selection or adaptation of the proposal distributions, interpreting the sampling and the weighting steps in different ways. In this talk, we establish a general framework for sampling and weighing procedures when more than one proposal are available. The most relevant MIS and adaptive MIS schemes in the literature are encompassed within the new framework, and, moreover novel valid schemes appear naturally. All the MIS schemes are compared and ranked in terms of the variance of the associated estimators. Finally, we provide illustrative examples which reveal that, even with a good choice of the proposal densities, a careful interpretation of the sampling and weighting procedures can make a significant difference in the performance of the method.