

Continuous Sequential Importance Sampling for Irreducible Diffusions

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I will present recent work on a sequential importance sampler, which provides a tool for exact (unbiased) inference for irreducible diffusions (that is ones for which the reduction to the unit diffusion coefficient case by the Lamperti transform is not possible). For this family of processes, exact simulation (ie free from discretisation error) using recently developed retrospective simulation techniques of Beskos, Papaspiliopoulos, Roberts and Fearnhead (JRSSB2006) is typically not possible. Thus the work significantly extends the class of discretisation error-free Monte Carlo methods available for diffusions. The methods are most useful in the multi-dimensional setting, where many interesting families of models (particularly in finance and population modelling) exhibit the irreducibility property.

This is joint work with Paul Fearnhead, Gareth Roberts and Giorgos Sermaidis