STOCHASTICS

Place and time: In M101 on Friday, Jan 5, at 16:00–17:30
Organizer: Lasse Leskelä (Aalto University)
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Minimum description length approach to stochastic block models

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Abstract. Stochastic block models are generalized random graphs, whose vertex set is partitioned into a finite number of blocks, and the edges are drawn randomly with probabilities that depend on the respective block or block pair. We also consider Poissonian block models, where vertex pairs are associated with independent Poisson random variables, whose parameters have a block structure as above. In applications, the matrix of links is observed, and the challenge is to identify the blocks. We show, for dense graphs, that Rissanen's Minimum description length principle identifies the partition with high probability, except possibly for tiny refinements of the true partition.

Joint work with Hannu Reittu and Fülöp Bazsó (Budapest).

Importance sampling type estimators based on approximate marginal MCMC

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Abstract. We consider importance sampling (IS) type weighted estimators based on Markov chain Monte Carlo (MCMC) targeting an approximate marginal of the target distribution. In the context of Bayesian latent variable models, the MCMC typically operates on the hyperparameters, and the subsequent weighting may be based on IS or sequential Monte Carlo (SMC), but allows for multilevel techniques as well. The IS approach provides a natural alternative to delayed acceptance (DA) pseudo-marginal/particle MCMC, and has many advantages over DA, including a straightforward parallelisation and additional flexibility in MCMC implementation. We detail minimal conditions which ensure strong consistency of the suggested estimators, and provide central limit theorems with expressions for asymptotic variances. Our experimental results are promising and show that the IS type approach can provide substantial gains relative to an analogous DA scheme, and is often competitive even without parallelisation.

Joint work with Jouni Helske and Jordan Franks.

Irregular fractional stochastic differential equations with applications to finance

Lauri Viitasaari *(University of Helsinki)*, lauri.viitasaari@aalto.fi

Abstract. In this talk we present some new results on stochastic differential equations that have highly irregular coefficients as well as irregular driving random noises. We also discuss some applications to mathematical finance.