

Exact Bayesian inference in spatiotemporal Cox processes driven by multivariate Gaussian processes

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Resumo

In this paper we present a novel inference methodology to perform Bayesian inference for Cox processes in space and/or time where the intensity function depends on a multivariate Gaussian process. The novelty of the method lies on the fact that no discretization error is involved despite the non-tractability of the likelihood function and the infinite dimensionality of the problem. The method is based on a Markov chain Monte Carlo algorithm that samples from the joint posterior distribution of the parameters and latent variables of the model. A particular choice of the dominating measure to obtain the likelihood function corrects previous attempts to solve the problem in an exact framework. The models allow the use of covariates to explain the dynamics of the intensity function. Simulated examples illustrate the methodology and compare different alternatives for some of the MCMC steps.