

$$S_t \circ c(h)(a_s)_{ti} c(s) + \mathfrak{S}_e m^i n(a_r)$$

Department of Mathematics, University of Utah



Perfect simulation of Matérn Type III point processes

Mark Huber

Duke University



Time and Place: Friday February 6, 2009; 3:00–4:00 p.m.; LCB 219

Spatial data are often more widely separated than would be expected if the points were independently placed. Such data can be modeled with repulsive point processes, where the points appear as if they are repelling one another. Various models have been created to deal with this phenomenon, and Matérn created three procedures that generate repulsive processes. While the third type allows the most flexibility in modeling, Matérn was unable to resolve the high dimensional integrations needed to utilize the process for inference. In this talk, I will show how to build an algorithm for using Matérn Type III processes that can be used to approximate the likelihood and posterior values for data. First, a Metropolis Markov chain is created using a secondary Poisson process. Next, this chain is used together with bounding chains to obtain perfect draws from the stationary distribution of the chain. Finally, a product estimator is constructed (again using a secondary Poisson process) in order to obtain approximations with provably good error bounds.