

Fitting of parametric models to spatial and space-time point patterns has been a very active research area in the last few years. Concerning clustered patterns, the Cox point process is the model of choice. To avoid the computationally demanding maximum likelihood estimation or Bayesian inference, several estimation methods based on the moment properties of the processes in question were proposed in the literature.

We give overview of the state-of-the-art moment estimation methods for stationary spatial Cox point processes and compare their performance in a simulation study. We also discuss generalization of such methods for inhomogeneous spatial point processes.

In the core part of the thesis we focus on minimum contrast estimation for inhomogeneous space-time shot-noise Cox point processes and investigate the possibility to use projections to the spatial and temporal domain to estimate different parts of the model separately. We propose a step-wise estimation procedure based on projection processes and also a refined method which remedies the problem of possible cluster overlapping.

We establish consistency and asymptotic normality of the estimators for both methods under the increasing window asymptotics and compare their performance on middle-sized observation windows by means of a simulation study. This makes the methods ready-to-use in practice.