



# Parametric estimation of spatial–temporal point processes using the Stoyan–Grabarnik statistic

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## Abstract

A novel estimator for the parameters governing spatial–temporal point processes is proposed. Unlike the maximum likelihood estimator, the proposed estimator is fast and easy to compute, and does not require the computation or approximation of a computationally expensive integral. This parametric estimator is based on the Stoyan–Grabarnik (sum of inverse intensity) statistic and is shown to be consistent, under quite general conditions. Simulations are presented demonstrating the performance of the estimator.

**Keywords** Conditional intensity · Cox process · Hawkes process · Maximum likelihood estimation · Poisson process · Space-time point process

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