



Optimize Spatial Sampling Design through the use of Point Processes

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In this paper we introduce a new methodology for constructing spatial sampling design. We use the realization of a spatial point process as sampling design points and optimize the design by optimizing the parameters of the point process. A number of spatial point processes are used to generate candidate sampling designs for different design criteria, and stochastic optimization algorithms are developed to deal with the computational problem. This method translates the high dimensional optimization problem of selecting sampling sites into a low dimensional optimization problem of searching for the optimal parameter sets in the point process. Simulation studies indicate that the proposed sampling design algorithm is more computationally efficient while the result of criterion minimization is comparable to traditional methods.

Keywords: Poisson point process, Neyman-Scott process.