

Nonlinear functionals estimation for Poisson observed processes

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Abstract

After the overview of known results concerning estimating the linear and nonlinear functionals of the density for i.i.d. observations and for functionals of the signal observed in the White Gaussian Noise (WGN) with small intensity we consider the similar problems for the observation the Poisson random process. Asymptotically efficient estimates of the once Frechet differentiable functionals are proposed for two observation models.

1. Estimating the functional of intensity function for n i.i.d. observations of Poisson process on the fixed time interval, $n \rightarrow \infty$.

2. Estimating the functional of $S(t)$ for one observation of the Poisson process with the intensity function $\varepsilon^{-1}S(t)$, $\varepsilon \rightarrow 0$.

Asymptotically efficient estimates for both models are created. Possible generalizations are discussed.