rtest1a

Problem Formulations

The aim of this package is to estimate an unknown univariate density $g(x)$ over the support of $S \subset \mathbb{R}$ from an n data set $\{x_1, \ldots, x_n\}$, realizations of random variable whose density is $g(x)$, by adopting the model:

$$f(x; \alpha, \beta) := p(x; \alpha) \cdot K(x; \beta),$$

where $p(x; \alpha)$ is a univariate polynomial with coefficients α and $K(x; \beta)$ is a density function over a support S. A polynomial $p(x; \alpha)$ is nonnegative over S, and a base function $K(x; \beta)$ is an instance of an exponential family of distributions, specifically, Gaussian distribution $K(x; \mu, \sigma) = \frac{1}{\sqrt{2\pi}\sigma} \exp\left(-\frac{(x-\mu)^2}{2\sigma^2}\right)$ when $S = (-\infty, \infty)$ or an exponential distribution $K(x; \lambda) = \lambda e^{-\lambda x}$ when $S = (0, \infty)$.