A sequential generalized DKL-optimum design for model selection and parameter estimation in non-linear nested models

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Abstract

A sequential procedure is proposed to select the best model among several nested non-linear models and to estimate efficiently the parameters of the chosen model. The procedure is based on an adaptive generalized DKL-optimum design, which is optimal for the double goal of model selection and parameter estimation. The proposed sequential scheme selects the best non-linear model with probability converging to one; moreover it estimates efficiently its parameters, since the adaptive sequential DKL-optimum designs converge to the D-optimum design for the "true" model. These results are proved by means of asymptotic theory arguments for argmin of convex random functions.

Keywords

DKL-optimality, Sequential design of experiments, Stochastic convergence, Semi-continuity, Argmin processes, Convexity.