Functional approach and nonlinear regression models

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Abstract

Session is devoted to problems of constructing optimal designs for nonlinear regression models. One of the major difficulties arises from the dependence of the asymptotic covariance matrix of the parameter estimates on the vector of true, but unknown, values of the parameters. A number of well known statistical approaches are applied to overcome this difficulty locally optimal, sequential, minimax and Bayesian. Constructing the corresponding optimal designs is a very difficult problem. It is hard to find explicitly even locally optimal designs; this is possible only for the simplest models with one or two unknown parameters. An approach based on the study of support points and weights of optimal designs as implicit functions of some auxiliary parameters has been developed in the last two decades [see Melas (2006)]. One of the talks of the session will be devoted to the development of methodology based on the functional approach for constructing and studying all types of optimal designs for models of exponential and rational form. One more class of models attracting attention is models with a covariance function depending on the parameters of the model. An approach to optimal design for such class will be presented. Another problem is that of constructing an adaptive sequential design for discriminating and estimating more than two nested nonlinear models.

References

Melas, V.B. (2006). *Functional Approach to Optimal Experimental Design.* Heidelberg: Springer.