On the methodology of optimal design for nonlinear models based on the functional approach

Viatcheslav B. Melas

St. Petersburg State University, Russia

Abstract

In this paper optimal designs for nonlinear regression models are investigated on the base of the functional approach. The idea of the approach consists in considering support points and weights of optimal designs as implicit functions of some auxiliary parameters. Under certain conditions to be discussed in the paper these functions can be represented by Taylor series and the coefficients of these series can be computed using recurrent formulas. In the recent book (Melas, 2006) this approach was implemented for locally optimal and maximin efficient designs. Here we will extend the approach to L- and D- optimal Bayesian designs. It allows constructing and studying all basic types of optimal designs for nonlinear models using the same methodology. Theoretical and numerical results for several specific models of rational type will be presented.