

Optimum Experimental Design for ODE and PDE Models

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This talk presents our approach and our methods for optimum experimental design of nonlinear differential equation systems.

In the first part we review the formulation of experimental design problems as the minimization of the uncertainties of parameter estimates. We present our numerical approach for the solution and our software package VPLAN. By means of industrial application examples we discuss several application strategies.

The second part of the talk deals with recent work on PDE models. Applications are, e.g., convection-diffusion-reaction, organic semiconductors and microbial enhanced oil recovery. For each problem, a suited simulation approach is chosen and equipped with an efficient derivative evaluation for the computation of optimal experimental designs. Finally a new approach of Derivative Extended POD is presented.