

Joint MPI and FMA Colloquium

SPEAKER

Univ.-Prof. Dipl.-Ing. Dr. Barbara Kaltenbacher

Institut für Mathematik, Universität Klagenfurt, Österreich

TOPIC

Iterative regularization of time-dependent inverse problems

ABSTRACT

A large number of inverse problems in applications ranging from engineering via economics to systems biology can be formulated as a nonlinear state space system, where some finite or infinite dimensional parameter is supposed to be identified from additional continuous or discrete indirect observations. This will be illustrated by some parameter identification problems in time dependent partial differential equations.

Due to the ill-posedness of such inverse problems -- especially in case of infinite dimensional parameters -- the problem needs to be regularized.

The focus of this talk will be on the use of iterative (gradient or Newton type) methods for this purpose, where regularization is achieved by early stopping. We will highlight the difference between classical reduced formulations based on a parameter-to-state-map, and an all-at-once approach. Moreover, we will consider a splitting of these inverse problems into smaller subsystems, by means of a subdivision of the time line in subintervals, as well as cyclic iterations over these subproblems -- so-called Kaczmarz methods.

Thursday, January 10, 2019, 4.00 p.m.

Max Planck Institute for Dynamics of Complex Technical Systems Sandtorstraße 1, 39106 Magdeburg, Seminar room Prigogine

Jointly organized by the Faculty of Mathematics at Otto von Guericke University and the Max Planck Institute Magdeburg