Kolloquium

ALGORITHMIC OPTIMIZATION

Im Rahmen des Kolloquiums des
Graduiertenkollegs Algorithmic Optimization
findet am

Montag, dem 17. Juni 2019
16 Uhr c.t.
Hörsaal 9

folgender Vortrag statt:

Optimization based formulation and regularization of inverse problems

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The conventional way of formulating inverse problems such as identification of a (possibly infinite dimensional) parameter, is via some forward operator, which is the concatenation of the observation operator with the parameter-to-state-map for the underlying model. Recently, all-at-once formulations have been considered as an alternative to this reduced formulation, avoiding the use of a parameter-to-state map, which would sometimes lead to too restrictive conditions. Here the model and the observation are considered simultaneously as one large system with the state and the parameter as unknowns.

A still more general formulation of inverse problems, containing both the reduced and the all-at-once formulation, but also the well-known and highly versatile so-called variational approach (not to be mistaken with variational regularization) as special cases, is to formulate the inverse problem as a minimization problem (instead of an equation) for the state and parameter. Regularization can be incorporated via imposing constraints and/or adding regularization terms to the objective.

In this talk, after giving a motivation by formulating the electrical impedance tomography problem by means of the classical Kohn-Vogelius functional, we will dwell on the regularization aspects for such variational formulations in an abstract setting. Indeed, combination of regularization by constraints and by penalization leads to new methods that are applicable without solving forward problems. In particular, for the EIT problem we will consider a method employing box constraints in a very natural manner to incorporate the discrepancy principle for regularization parameter choice as well as a priori information on the searched for conductivity.

Gastgeber:
Prof. Dr. Volker Schulz
Kolloquiums Kaffee ab 15:45 Uhr im Raum E 10