



Lothar-Collatz-Kolloquium für Angewandte Mathematik

Donnerstag, den 27. April 2017, um 17:15 Uhr, im Hörsaal 5

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Solving nonlinear inverse problems by sequential subspace optimization with an application to terahertz tomography

Zusammenfassung/Abstract:

Sequential Subspace Optimization (SESOP) is an iterative regularization technique for efficiently solving inverse, ill-posed problems. So far it has been developed for linear inverse problems in Hilbert and Banach spaces. The key idea is to use not only one search direction (as in Landweber-type iterations), but multiple search directions to reduce the computation time. In this talk we want to introduce an adaption of this method to nonlinear inverse problems. To this end, we iteratively project the initial value onto stripes whose width is determined by the search direction, the nonlinearity of the operator and the noise level. We give a short introduction to inverse and ill-posed problems, discuss convergence and regularization properties of our method and present a fast algorithm that uses two search directions. The talk concludes with numerical experiments in terahertz tomography, where we compare Landweber's method with SESOP.

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