



Einladung zum Vortrag

Optimal sensor placement in source location tasks

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Zusammenfassung: Model-based simulation approaches for complex physical systems often require the identification of unknown parameters from scarce measurements provided by a finite number of sensors.

In order to maximize the amount of information provided, the optimal placement of measurement sensors based on the a priori solution of mathematical programs has become a widespread paradigm. While this is, naturally, a bi-level problem, standard approaches rely on single-level optimality criteria involving the Hessian of a suitable, linearized least-squares estimator which often explicitly depends on the measurement setup.

On the other hand, variational regularization approaches involving structure-enhancing, complex regularization terms are a cornerstone of modern inverse problem theory.

In this talk, we give a first principled derivation of optimal sensor placement problems for the latter for a particular example, sparse minimization problems over spaces of Radon measures, which are prevalent models in machine learning applications as well as for challenging tasks such as source location problems. Starting from a suitable estimator, we derive meaningful optimality criteria and present numerical as well as analytical results for deconvolution tasks. The talk will, in particular, discuss the challenges in transferring these preliminary results to real-world scenarios and explores first avenues in this direction.

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