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Towards optimal sensor placement for sparse inverse problems

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In this talk, we study parameter identification problems from a finite number of measurements under a sparsity assumption. Since the data is contaminated by Gaussian noise, a statistical framework for its recovery is considered. It relies on two main ingredients, first, a convex but nonsmooth Tikhonov point estimator over the space of Radon measures and, second, a suitable mean-squared error based on its Hellinger-Kantorovich (H-K) distance to the ground truth.

Assuming standard non-degenerate source conditions as well as applying careful linearization arguments, we derive a sharp upper bound for the H-K distance between the aforementioned ground truth and an estimator. On the one hand, this allows to derive asymptotic convergence results for the mean-squared error, which is later used as a crucial tool for sensor placement problem. Finally, we present some numerical results to illustrate our theory.

This is a joint work with Konstantin Pieper and Daniel Walter.

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