

Randomized Krylov methods for inverse problems

Friday, September 5, 2025 9:30 AM (30 minutes)

In this talk we introduce some randomized iterative methods for efficiently computing regularized solutions to large-scale discrete linear inverse problems. Specifically, we consider methods based on both the recently-developed randomized Arnoldi algorithm and a new strategy that can be regarded as a randomized Golub-Kahan algorithm. Building on such algorithms, both purely iterative and hybrid projection regularization methods are developed; the latter support automatic regularization parameter selection strategies through modifications of existing regularization parameter choice rules. Theoretical results are provided, and numerical tests from image deblurring and tomography show the benefits of these approaches.

Primary authors: CHUNG, Julianne; GAZZOLA, Silvia (University of Pisa)

Presenter: GAZZOLA, Silvia (University of Pisa)

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