

Sketched and truncated polynomial Krylov subspace methods

Sketching can be seen as a random dimensionality reduction able to preserving the main features of the original problem with probabilistic confidence. Such kind of techniques is emerging as one of the most promising tools to boost numerical computations and it is quite well-known by theoretical computer scientists. Nowadays, sketching is getting popularity also in the numerical linear algebra community even though its use and understanding are still limited.

In this talk we present the main concepts related to sketching and how the latter can be combined with Krylov subspace methods.

We will focus on the solution of large-scale linear systems as model problem. On the other hand, thanks to the novel sketched Arnoldi relation we will illustrate, the results discussed in this talk can be extended to a panel of diverse algebraic problems ranging from the numerical evaluation of matrix functions to the solution of matrix equations.

This talk is based on a joint work with Valeria Simoncini and Marcel Schweitzer.

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