Randomized sketching of Krylov methods in numerical linear algebra

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Abstract

Many large-scale computations in numerical linear algebra are powered by Krylov methods, including the solution of linear systems of equations, least squares problems, linear and nonlinear eigenvalue problems, matrix functions and matrix equations, etc. We will discuss some recent ideas to speed up Krylov methods for these tasks using randomized sketching, and highlight some of the key challenges for future research.