

STREAMING METHODS FOR INVERSE PROBLEMS

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We discuss Krylov-type methods and variations for streaming problems. As big data applications become ever more prominent, in many applications we can only solve problems such as linear or nonlinear regression problems in pieces or segments. Data may come in over a longer span of time and we cannot (or prefer not) to wait until all the data is available, in other cases the problem may be too large to fit in memory, or data is coming in at a rate that we can use only sampled data and use it in segments. There is a need for methods that can work efficiently under such conditions. We discuss extensions for Golub-Kahan Bidiagonalization-type methods as well Generalized Krylov Subspace methods that select and build effective search spaces over multiple subsets of data and submatrices to compute accurate solutions with limited memory available. Apart from streaming applications this may also be useful for modern computing architectures that have highly non-uniform memory access. This is joint work with Julianne Chung, Jiahua Jiang, Misha Kilmer, Mirjeta Pasha, and Sejal Gupta.