APPROXIMATIONS FROM SUBSPACES FOR THE SINGULAR VALUE PROBLEM

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Abstract

The computation (or approximation) of some of the smallest or largest singular values of a large sparse matrix is a big challenge, having many important applications.

In this talk we discuss approximations to singular triples that can be obtained from subspaces. One of the topics is the concept of harmonic singular triples, introduced in [1]. The word "harmonic" expresses the fact that we try to approximate the smallest singular value by approximating the largest singular value of the inverse of the matrix. We give a definition, some properties, and show how harmonic singular values can be used in subspace methods. Some applications are given.

References

[1] M.E. Hochstenbach, A Jacobi-Davidson type SVD method, SIAM J. on Sci. Comp. 23(2), pp. 606–628, 2001.