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Vladimir Rokhlin* (rokhlin@cs.yale.edu), Yale University, New Haven, CT 06520. *Fast Randomized Algorithms of Numerical Linear Algebra.*

In this talk, I will describe a new class of randomized algorithms for the solution of several problems of numerical linear algebra: compression and diagonalization of matrices, construction of the singular value decomposition of operators, etc. Unlike most classical randomized numerical schemes, new procedures produce results that are accurate to the precision of computations; they are competitive with their deterministic counterparts even for relatively small-scale problems and remarkably insensitive to the quality of the random number generators used. Their performance will be illustrated via several numerical examples.

I will discuss possible generalizations of the approach, and its applications in data mining, search engines, and several other environments. (Received September 21, 2007)