

# Randomized Algorithms for Matrix Computations

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## **Abstract**

The emergence of massive data sets, over the past fifteen years, has led to the development of a new class of matrix algorithms, so-called randomized algorithms. Such randomized algorithms are being designed for matrix multiplication, solution of least squares problems, and low-rank approximations; and have been used effectively in applications like machine learning, population genomics, astronomy and nuclear engineering.

We give a flavour of a randomized algorithm for the solution of least squares/regression problems. Along the way we illustrate important concepts from numerical analysis (conditioning and preconditioning) and statistics (sampling, coherence and leverage scores).