Matrix Computations and Scientific Computing Seminar

Organizer: J. Demmel and M. Gu

Wednesday, 12:10–1:00 pm, 380 Soda Hall

Oct 5 **Jianwei Xiao**, UC Berkeley

On reliability of randomized QR factorization with column pivoting

Factorizing large matrices by QR with Column Pivoting (QRCP) typically requires substantially more processing time than QR without pivoting, owing to the communication costs required to process pivoting decisions. In contrast, randomized QRCP (RQRCP) algorithms have proven themselves to be highly competitive with high-performance library implementations of QR in processing time, on unit processor and shared memory machines, yet as reliable as QRCP in pivot quality.

In this talk, we show that RQRCP algorithms can be as reliable as QRCP with failure probability that exponentially decays with oversampling size. Meanwhile, our distributed memory implementation of RQRCP is significantly more efficient than the corresponding QRCP routines in ScaLAPACK.