

Matrix Computations & Scientific Computing Seminar

Organizer(s): James Demmel, Ming Gu & Beresford Parlett

Wednesday, 11:00am–12:00pm, 380 Soda

Dec. 2 **Grey Ballard**, UC Berkeley

Communication Bounds for Sequential and Parallel Eigenvalue Problems

We propose a set of divide-and-conquer algorithms for eigenvalues and eigenvectors that minimize communication (between levels of memory on a sequential computer and between processors on a parallel computer) in an asymptotic sense. The algorithms use as building blocks matrix multiplication and QR decomposition, each of which can be implemented by communication-optimal algorithms. The algorithms depend on a randomized rank-revealing QR decomposition to minimize the communication complexity while keeping the algorithms stable.