Reliable Condition Number Estimation with Random Sampling

Ming Gu, UC Berkeley

October 17, 2012

Condition number estimation has traditionally been regarded as a 'quick and dirty' way to compute some estimation of the condition number of a given matrix. Typical condition number estimators usually do a good job of estimating the condition number to within a small factor, but can fail to estimate the condition number to any accuracy.

In this talk we show how to use randomized sampling to estimate condition numbers. Except a tiny failure probability, our algorithm computes reliable condition estimators. We also generalize this algorithm to efficiency and compute the p-norm of a given matrix.

Joint work with Chris Melgaard.