Matrix Computations & Scientific Computing Seminar

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

Wednesday, 11:00am–12:00pm, 380 Soda

Sept. 23   **Prof. Keith Miller**, UC Berkeley
Dynamic Alternating Direction Implicit, Bounds from Monotone Inequalities

I'll discuss two topics from my own research in which computer generated quantities play a greater than usual role in guiding the course of a numerical method - Dynamic Alternating Direction Implicit (ADI) and Finding Bounds from Monotone Inequalities. I'd like to suggest that it might be worthwhile to invent other methods which do something similar. In the 1st topic Said Doss and I let the computer decide dynamically how to change the "ADI timestep" in linear and nonlinear elliptic problems. The choice is based upon analysis of a highly simplified model, but it leads to a numerical method that works, and works well, in situations far beyond the extremely restrictive assumptions of the analysis. In the 2nd topic I let the computer generate tight a posteriori bounds, for example on the location of poles in my stabilized numerical analytic continuation with poles.