

Matrix Computations & Scientific Computing Seminar

Organizer: James Demmel & Ming Gu

Wednesday, 11:00am–12:00pm, 380 Soda

Sept. 8 **Joseph Grcar**

The History of "Gaussian" Elimination

Gaussian elimination is universally known as "the" method for solving simultaneous linear equations. As Leonhard Euler remarked in 1771, it is "the most natural way" of proceeding. The method was invented in China about 2000 years ago, and then it was reinvented in Europe much more recently, so it is surprising that the primary European sources have not been identified until now. It is an interesting story in the history of computing and technology that Carl Friedrich Gauss came to be mistakenly identified as the inventor of Gaussian elimination even though he was not born until 1777. The European development has three phases. First came the "schoolbook" method that began with algebra lessons written by Isaac Newton; what we learn in high school or middle school is still basically Newton's creation. Second were methods that professional hand computers used to solve the normal equations of least squares problems; until comparatively recently the chief societal use for Gaussian elimination was to solve normal equations for statistical estimation. Third was the adoption of matrix notation; henceforth the schoolbook lesson and the professional algorithms were understood to be trivially related in that all can be interpreted as computing triangular decompositions.