MATRIX COMPUTATIONS AND THE SECULAR EQUATION

Gene H Golub
Stanford University, USA
e-mail: golub@stanford.edu

Abstract

The "secular equation" is a special way of expressing eigenvalue problems in a variety of applications. We describe the secular equation for several problems, viz eigenvector problems with a linear constraint on the eigenvector and the solution of eigenvalue problems where the given matrix has been modified by a rank one matrix. Next we show how the secular equation can be approximated by use of the Lanczos algorithm. Finally, we discuss numerical methods for solving the approximate secular equation.