SOME MODIFIED EIGENVALUE PROBLEMS

G.H. Golub

In many applications, various eigenvalue problems arise which are slightly nonstandard. That is, the usual algorithms for computing eigensystems are not directly applicable. For instance, in various statistical data-fitting problems, it is desirable to find $\min_{x \neq 0} \frac{x'Ax}{x'Bx}$ subject to the constraint $C'x = 0$. In this talk we shall present an algorithm for reducing this problem to the usual eigenvalue problem. In addition, we shall consider methods for solving the eigenvalue problem $Ax = \lambda Bx$ when A and B are singular and we shall consider the problem of determining the eigensystem of a matrix which has been modified by a matrix of rank one.