998-65-165   **Richard A. Tapia*** (`rat@rice.edu`), CAAM - MS 134, Rice University, 6100 Main Street, Houston, TX 77005-1892. *Inverse, Shifted Inverse, and Rayleigh Quotient Iteration as Newton's Method.*

The inverse, shifted inverse, and Rayleigh quotient iterations are well-known algorithms for computing an eigenvector of a symmetric matrix. In this talk we demonstrate that each one of these three algorithms can be viewed as a standard form of Newton's method from the nonlinear programming literature, involving an norm projection. This provides an explanation for their good behavior despite the need to solve systems with nearly singular coefficient matrices. Our equivalence result also leads us naturally to a new proof that the convergence of the Rayleigh quotient iteration is q-cubic with rate constant at worst 1. (Received February 24, 2004)