ABSTRACT

Speaker: Michael Neumann

Title: SPECTRAL RADII OF FIXED FROBENIUS NORM PERTURBATIONS OF NONNEGATIVE MATRICES

Abstract: Let A be an $n \times n$ nonnegative matrix. We consider the problems of maximizing the spectral radii of (i) $A+X$ and (ii) $A+D$, where X is a real $n \times n$ matrix whose Frobenius norm is restricted to be 1 and where D is as X, but is further constrained to be a diagonal matrix. Both problems have maximums which occur at nonnegative X and D, and we use tools of nonnegative matrices, most notably due to Levinger and Fiedler, as well as the Kuhn–Tucker criterion for constrained optimization, to find upper and lower bounds on the maximums, and, when A is additionally assumed to be irreducible, to characterize cases of equalities in these bounds. This is joint work with Lixing Han and Michael Tsatsomeros.