An equivalence result in the symmetric nonnegative inverse eigenvalue problem

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We say that a list of real numbers is "symmetrically realisable" if it is the spectrum of some (entrywise) nonnegative symmetric matrix. The Symmetric Nonnegative Inverse Eigenvalue Problem (SNIEP) is the problem of characterising all symmetrically realisable lists.

We present a recursive method for constructing symmetrically realisable lists. The properties of the realisable family we obtain allow us to make several novel connections between a number of sufficient conditions developed over forty years, starting with the work of Fiedler in 1974. We show that essentially all previously known sufficient conditions are either contained in or equivalent to the family we are introducing.

This is a joint work with RICHARD ELLARD (University College Dublin).