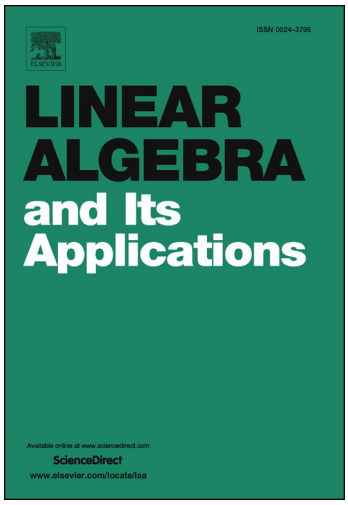

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Universal realizability of spectra with two positive eigenvalues*

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Abstract

A list of eigenvalues is said to be realizable if it is the spectrum of a nonnegative matrix, diagonalizably realizable (DR) if it is the spectrum of a diagonalizable nonnegative matrix, and universally realizable (UR) if there is a nonnegative matrix with this spectrum and any possible Jordan canonical form allowed by the spectrum. The nonnegative inverse eigenvalue problem (NIEP) asks which lists are realizable. It is known that there exist spectra that are realizable, but not DR. We raise the question of whether DR implies UR. This is known in a few cases, including $n \leq 4$, nonnegative spectra, and Suleimanova spectra. We add some new classes of spectra that are UR.

AMS classification: 15A18, 15A21, 15A29, 15B99

Key words: nonnegative matrix, inverse eigenvalue problem, Jordan canonical forms, universal realizability

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