

Zero Forcing and the Number of Distinct Eigenvalues

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Zero Forcing is a colour game played on the vertices of a graph. It is a powerful tool to determine an upper bound on the maximum multiplicity of eigenvalues of a real symmetric matrix that can be reached as the non-zero entries are allowed to vary. This concept is closely related to the well-known still-open

Inverse Eigenvalue Problem: Given a list \mathcal{L} of real numbers $\lambda_1, \lambda_2, \dots, \lambda_n$, is there a $n \times n$ real matrix with spectrum \mathcal{L} ?

Investigate the zero forcing number of some classes of graphs to shed light on the minimum number of distinct eigenvalues of the adjacency matrices of the edge weighted graphs in these classes.