

Algebraic and Geometric Multiplicity of Hypergraph Eigenvalues

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Abstract

Eigenvalues of a graph are defined as eigenvalues of the corresponding adjacency matrix. We define an adjacency hypermatrix for hypergraphs and discuss how to extend the linear algebraic ideas of eigenvalues and eigenvectors to hypermatrices. We introduce the algebraic and geometric multiplicity of such hypermatrix eigenvalues, show why the values are not as similar as in the matrix setting, and discuss results which start tackling the problem of relating these two multiplicities.

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