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Gluing via block similarity matrices for distance matrices

A common method to form cospectral graphs is to glue two graphs on a common vertex. The justification is often carried out by the use of combinatorial interpretations of coefficients of characteristic polynomials that can be readily computed using sparseness of the related matrices. However, if the matrix is dense, e.g. a distance matrix, this approach does not work.

In this talk we will look at how to use block similarity matrices to form cospectral constructions via gluing which work for many classes of matrices, including the adjacency, Laplacian, signless Laplacian, distance, and generalized distance matrix.

This work is the culmination of two REU projects that happened at Iowa State University in recent years.