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Simultaneous embeddings of nested interval graphs

A proper interval graph is a graph that has an adjacency matrix which is diagonally increasing: rows and columns are unimodal, with the maximum occurring at the diagonal. It is well-known that proper interval graphs have a unit interval representation: vertices can be embedded in \mathbb{R} so that vertices are adjacent if and only if their embedded values are within a threshold distance d from each other. We extend this notion to diagonally increasing (symmetric) matrices that have interval values greater than 1. Such matrices can be written as the sum of adjacency matrices of a nested family of proper interval graphs. we study the question whether it is possible, given a diagonally increasing matrix A , we can find an embedding which is a unit interval representation for all graphs in the nested family simultaneously. This is joint work with Zhiyuan (Owen) Zhang.