Orthogonal representations of graphs with a view towards Algebraic Combinatorics

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(Joint work with Aldo Conca)

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An orthogonal representation of a graph is a map from the vertex set of an undirected graph to d-dimensional real space such that vertices not connected by an edge are sent to orthogonal vectors. Lovasz defined this concept in the 70s motivated by the study of the Shannon capacity of a graph. Optimizing over all orthonormal representations allowed him to define the Lovasz number of a graph. Later joint with Saks and Schrijver he studied the set of all orthogonal representations of a given graph from a geometric point. We follow up on this from the algebraic side and provide results on the limiting behavior of the defining ideal of orthogonal representations when d goes to infinity and relations to ideals of minors.