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The threshold strong dimension of a graph

A set W of vertices of a connected graph G is a *strong resolving set* for G if, for every pair of vertices, one of the vertices in the pair lies on a shortest path from the other vertex to some vertex of W. The smallest cardinality of a strong resolving set of vertices of G is the *strong dimension* of G. The *threshold strong dimension* of G is the smallest strong dimension among all graphs having G as a spanning subgraph, and it is denoted by $\tau_s(G)$. We present a geometric characterization of $\tau_s(G)$, which expresses $\tau_s(G)$ in terms of the smallest number of paths (each of sufficiently large order) whose strong product admits a certain type of embedding of G. We also establish logarithmic bounds on $\tau_s(G)$ for graphs in general, and for trees. This is joint work with Nadia Benakli, Novi H. Bong, Linda Eroh, Beth Novick, and Ortrud Oellermann.