

Representing graphs by paths and a related extremal problem.

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Abstract

A path representation of a simple graph G is a simple graph H along with an edge partition $\mathcal{P} = \{P_u : u \in V(G)\}$ of H into non-trivial paths such that $\{u, v\} \in E(G)$ if and only if P_u and P_v intersect in H . A path representation is proper if no two paths in \mathcal{P} can be concatenated into another path. The *path representation number*, $\text{prn}(G)$, of a graph G is the minimum number of vertices in any proper path representation of G .

In this talk, we investigate proper path representations of various classes of graphs, including complete bipartite graphs, complete graphs, the Erdos-Renyi random graph $G(n, p)$, and triangle-free graphs, particularly trees.

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