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Colored graph completion problem for classes of chordal graphs

The Π -Colored Graph Completion (Π -CGC) problem asks whether a graph properly vertex-colored with k colors (k either constant or arbitrary) can be completed by adding edges to have property Π , while maintaining the proper coloring. We present an $O(n^2)$ -time algorithm for strongly chordal CGC when $k = 3$; it is NP-complete when k is arbitrary. When $k = 3$, there are efficient algorithms for interval graph CGC and chordal CGC. Our result nests in a structural hierarchy of characterizations of when a graph admits an interval completion, strongly chordal completion, or chordal completion. Joint work with R. Sritharan, X. Wang.