Graceful Embedding of a Signed Graph

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Abstract

Let $S = (V, E, s)$ be a signed graph with $|V| = p$, $|E| = q$ and $s : E \to \{+, -\}$ a function which assigns a sign $+$ or $-$ to each edge. For any injection $f : V \to \{0, 1, \ldots, q\}$, the induced edge labeling g_f is defined by $g_f(uv) = s(uv)|f(u) - f(v)|$. The function f is said to be a graceful labeling of S if $g_f(E^+) = \{1, 2, \ldots, |E^+|\}$ and $g_f(E^-) = \{-1, -2, \ldots, -|E^-|\}$ where E^+ and E^- denote the set of all positive and negative edges of S respectively. A signed graph which admits a graceful labeling is called a graceful signed graph. In this paper we investigate the problem of embedding a signed graph S into a graceful signed graph S' such that S' is eulerian, hamiltonian, triangle-free or planar. We also prove that every signed tree can be embedded in a graceful signed tree.

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