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Matrix Scaling: A New Heuristic for the Feedback Vertex Set Problem.

For a digraph G , a set $F \subseteq V(G)$ is said to be a feedback vertex set (FVS) if $G - F$ is acyclic. The problem of finding a smallest FVS is NP-hard. We present a matrix scaling technique for finding feedback vertex sets in un-weighted directed graphs that runs in $O(|F| \log(|V|)|V|^2)$ time. Our technique is empirically shown to produce smaller feedback vertex sets than other known heuristics. (Received September 16, 2014)