Labeling the vertices of a graph

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(joint work with Aysun Aytaç)

Let G be a simple, connected graph. For a vertex subset $S \subseteq V$, $\bar{S} = V(G) - S$ denotes the complement of S with respect to $V(G)$. The shortest distance in G between two vertices u and v is denoted by $d(u,v)$. For any vertex u, let $d(u,S) = \min_{v \in S} d(u,v)$. Then $d(u,S) = 0$ and only if $u \in S$. The total influence number of a vertex $v \in S$ is $\eta_T(v) = \displaystyle\sum_{u \in \bar{S}} \frac{1}{2^{d(u,v)}}$. The total influence number of a vertex subset S is $\eta_T(S) = \sum_{v \in S} \eta_T(v) = \sum_{v \in S} \sum_{u \in \bar{S}} \frac{1}{2^{d(u,v)}}$. The total influence number of a graph G is $\eta_T(G) = \max_{S \subseteq V} \eta_T(S)$. A set S is called η_T-set if $\eta_T(S) = \eta_T(G)$. In this paper, we give a general theorem related to the total influence number and we also show how to find a maximum total influence set on some splitting graphs.

MSC2000: 68R10, 68M10, 05C78.

Keywords: Network design and communication; influence number; total influence number; splitting graph.