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A better constant-factor approximation for weighted dominating set in unit disk graph.
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Summary: This paper presents a $(10+\varepsilon)$-approximation algorithm to compute minimum-weight connected dominating set (MWCDS) in unit disk graph. MWCDS is to select a vertex subset with minimum weight for a given unit disk graph, such that each vertex of the graph is contained in this subset or has a neighbor in this subset. Besides, the subgraph induced by this vertex subset is connected. Our algorithm is composed of two phases: the first phase computes a dominating set, which has approximation ratio $6+\varepsilon$ (ε is an arbitrary positive number), while the second phase connects the dominating sets computed in the first phase, which has approximation ratio 4.

MSC:

05C69 Vertex subsets with special properties (dominating sets, independent sets, cliques, etc.)
05C22 Signed and weighted graphs

Keywords:

wireless network; connected dominating set; unit disk graph

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