

Bounds and heuristics for limited packings in graphs

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Facility location problems can require a restricted number of facilities placed in each particular neighbourhood on a network. These requirements can be modelled on graphs by considering so called (closed neighbourhood) packings and their generalization called limited packings. A vertex set X in a graph G is a *k-limited packing* if for any vertex $v \in V(G)$, $|N[v] \cap X| \leq k$, where $N[v]$ is the closed neighbourhood of v , and k is a positive integer. The *k-limited packing number* $L_k(G)$ is the largest size of a k -limited packing in G . We develop probabilistic and greedy approaches to limited packings in graphs, providing lower bounds for the k -limited packing number, and randomized and greedy algorithms to find k -limited packings satisfying the bounds. Some upper bounds for $L_k(G)$ are shown as well. This is joint work with Vadim Zverovich, University of the West of England, Bristol, UK.