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Paired neighborhood in graphs. (English summary)

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Let $G=(V,E)$ be a finite simple graph with no isolated vertices. For any vertex v in G let $N(v)$ denote the set of all vertices adjacent to v in G and set $N[v]=N(v)\cup\{v\}$. For a vertex set A of G, the subgraph induced by A is denoted by $\langle A\rangle$. A set $S\subseteq V$ is said to be a neighborhood set of G if $G=\bigcup_{v\in S}\langle N[v]\rangle$ and a neighborhood set S is said to be a paired-neighborhood set if $\langle S\rangle$ contains at least one perfect matching. The paired-neighborhood number is the smallest cardinality of a paired-neighborhood set of G and is denoted by $\eta_{\rm Pair}(G)$. In this paper, the authors investigate some lower and upper bounds for $\eta_{\rm Pair}(G)$. For some special classes of graphs the exact values for $\eta_{\rm Pair}(G)$ are found. Some results on the relationships between $\eta_{\rm Pair}(G)$ and other graph parameters, such as the maximum degree of G, the maximum number of independent edges of G and the total domination number of G, are also presented. *Bing Wei*