An efficient Linear Algorithm for Paired-domination Numbers of Trees
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The paired-domination was introduced by Haynes and Slater in 1995 as a model for assigning backups to guards for security proposes, and it was shown that the problem on general graphs is $NP$-complete. In 2003, Qiao et al gave a linear algorithm for obtaining the paired-domination numbers of trees based on the paired-domination numbers of paths. The advantage of taking paths into consideration is because the paired-domination numbers of paths could be obtained $O(1)$ time according to their lengths; however, in their algorithm, there involves a complicated step to break a tree in a collection of paths. In this paper, we propose another algorithm in which the complicated step can be avoided. We also give the experimental results to compare the two algorithms.

Keywords: paired-domination, trees, linear algorithm