A Kidney Algorithm for Pairwise Test Suite Generation

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Pairwise testing can greatly minimize the cost of software testing and also increase the ability of fault detection. Nevertheless, generating the most optimal test suite is an NP-complete problem and still an open area for research. The test case generation is the most active area of the pairwise testing research. Metaheuristic algorithms have been broadly used for solving difficult optimization problems as well as proving their effectiveness to get most optimal solutions. Kidney algorithm (KA) is a recent metaheuristic algorithm. This study introduces a new pairwise strategy by adapting KA; which is the first time to adapt KA in generating the test suite. The proposed strategy is called Pairwise Kidney Strategy (PKS). This study also highlights the PKS design; in addition, compare its performance with other reported strategies in the literature in terms of test suite size. Experiment results show that PKS has very competitive results as compared with other strategies.

Keywords: Combinatorial Interaction Testing, Pairwise Testing, Software Testing, Metaheuristic Algorithms, Kidney Algorithm, Optimization Algorithms.