Adapting the elitism on greedy algorithm for variable strength combinatorial test cases generation

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ABSTRACT

A combinatorial testing (CT) is an important technique usually employed in the generation of test cases. The generation of an optimal sized test case is a non-deterministic polynomial hard problem. In recent times, many researchers had developed various strategies based on the search-based approach to address the CT issues. This study presented the most recent variable interaction strength (VS) CT strategy using an enhanced variant in the greedy algorithm. Hence, they are referred to as variable strength modified greedy strategy (VS-MGS). Moreover, the modified strategy supports a VS together with interaction strength up to six. The proposed variant-greedy algorithm employed the elitism mechanism alongside the iteration in order to improve its efficiency. This algorithm is invariably called the modified greedy algorithm (MGA). Furthermore, the efficiency and performance of the VS-MGS using MGA were assessed first by comparing its results with the original greedy algorithm results and thereafter benchmarked with the results of the existing VS CT strategies. The VS-MGS's results ultimately revealed that the adaptation of elitism mechanism with iteration in greedy algorithm resulted in an improved efficiency in the process of generating a near-optimal test case set size.