

The effect of replacement strategies of genetic algorithm in regression test case prioritization of selected test cases

ABSTRACT

Regression testing is one of the software maintenance activities that is time consuming and expensive. Design-based regression testing approaches have been proposed to address changes at higher levels of abstraction, these approaches may not detect changes in the method body and several of the code based addresses procedural programs. This study presents an optimized regression test case prioritization of selected test cases for object-oriented software using Genetic algorithm with different replacement strategies. The goal is to compare different replacement strategies of GA and select the best strategy that will make prioritization to order selected test cases based on their fitness. We provide case studies to demonstrate the differences between the strategies. We measured the performances of each replacement strategy in GA by using Average Percentage of rate of Faults Detection (APFD) metric. It was observed from the results that replacement of worst individual and replacing the parent increased the effectiveness of regression testing compared with two other replacement strategies in term of rate of fault detection.

Keyword: Regression testing; Evolutionary algorithm; Regression test case prioritization; GA replacement strategy; Malaysia