

Evolutionary cost cognizant regression test prioritization for object-oriented programs based on fault dependency

ABSTRACT

Regression testing performed to provide confidence on the newly or updated software system is a resource consuming process. To ease this process, various techniques are developed. One such technique, test case prioritization, orders test cases with respect to the goals such that the most important test case in achieving those goals is scheduled earlier during the testing session. Among such performance goals, the rate of faults detections, measure how faults are detected quickly throughout the regression testing process. Improved dependency detection among faults provides faster feedback to the developers which gives chance to debug leading faults earlier in time. One other goal, the rate of fault severity detection, measure how fast severe fault can be detected in the testing process. Although, previous works address these issues but assumed that the costs of executing test cases and severities of detected faults are the same. However, costs of test and severities of faults varied. Furthermore, they did not consider incorporating evolution process such as applying genetic algorithms to their technique. In this work, we proposed an evolutionary cost-cognizant regression testing approach that prioritizes test case according to the rate of severity detection of test cases connected with dependent faults using genetic algorithms. The aim is to reveal more severe leading faults earlier using least cost in executing the test suite and to measure the efficacy of the technique using APFDc.

Keyword: Test case prioritization; Regression testing; Genetic algorithms; APFDc