A HIERARCHICAL TEST CASE PRIORITIZATION TECHNIQUES FOR ASPECT-ORIENTED SOFTWARE

[1]SUSHIL KUMAR & [2]NARESH CHAUHAN

[1]Assistant Professor (Deptt of Computer Engg), YMCA University of Science & Technology, Faridabad Haryana-121006, India.

[2]Professor (Deptt of Computer Engg.), YMCA University of Science & Technology, Faridabad Haryana - 121006, India.

ABSTRACT

Aspect Oriented Programming is a new paradigm for developing software. It is the way to modularize the cross-cutting concerns. As it is in its evolving phase it poses some challenges, one of which is testing AO programs. As there are some basics differences between AOP and OOP, there is need of new testing approach for AO programs. One of the approaches used to test AO programs is state-based incremental testing. Testing of aspect(s)-class block is done incrementally. As the aspects are incremented there is need of regression testing with the objective to ensure that the integration is done without affecting the original behaviour of the class.

One of the major problems encounter during state-based incremental testing is: as the number of aspects to be added increases, the number of test cases on which regression testing has to be performed also increases exponentially. This scenario leads to exhaustive testing which is both impractical and inefficient.

In the work presented a new framework for state-based incremental testing of Aspect Oriented Program has been proposed. As the focus of the work is improving the efficiency of regression testing performed therefore a new algorithm, Hierarchical Test Case Prioritization(HTCP) in State-based Incremental Testing for Aspect Oriented Programs has been proposed. HTCP takes hierarchical prioritization into consideration with the goal of maximizing the rate of fault detection at first level and at the second level goal is to increase the rate of detection of high-risk faults, locating those faults earlier in the testing process. Evaluation and Analysis of the framework has been performed using Average Percentage of Faults Detection (APFD) metric. The analysis is done by comparing the Prioritization Test Suite, which is the result of proposed HTCP algorithms and Non-prioritized test suite.

KEYWORDS: AOP, APFD, AO, HTCP, OO, OOP