

Abstract

Essam Kosba

Software Testing Suite Prioritization Using Multi-Criteria Fitness Function

Regression testing is the process of validating modifications introduced in a system during software maintenance. It is an expensive, yet an important process. As the test suite size is very large, system retesting consumes large amount of time and computing resources. Unfortunately, there may be insufficient resources to allow for the re-execution of all test cases during regression testing. Testcase prioritization techniques aim to improve the effectiveness of regression testing, by ordering the testcases so that the most beneficial are executed first with higher priority. The objective of test case prioritization is to detect faults as early as possible. An approach for automating the test case prioritization process using genetic algorithm with Multi-Criteria Fitness function is presented. It uses multiple control flow coverage metrics. These metrics measure the degree of coverage of conditions, multiple conditions and statements that the test case covers. These metrics are weighted by the number of faults revealed and their severity. The proposed Multi-criteria technique showed superior results compared to similar work.