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A Survey Novel Approach for Efficient Selection of Test Case Prioritization Techniques

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ABSTRACT

Test case prioritization techniques schedule test cases to reduce the cost of regression testing and to maximize some objective function. Test cases are prioritized so that the test cases that are most important according to certain criteria are performed first in the regression test process. There are numerous techniques in the literature that focus on achieving various test objectives in the early stages of the process and, therefore, reduce their cost. Despite this, evaluators generally prefer only a few known techniques for prioritizing test cases. The main reason behind this is the lack of guidelines to select TCP techniques. Therefore, this part of the research introduces a new approach to classify TCP techniques using fuzzy logic to support the efficient selection of test case prioritization techniques. This work is an extension of the selection scheme already proposed for the prioritization techniques of test cases.

1. Introduction

In testing part Regression testing in maintenance phase is actually the process of retesting the updated software to ensure that new errors have not been introduced into earlier validated code. In addition, the regression tests should take as little time as possible in order to perform as few test cases as possible. Due to its costly nature, there are several techniques in the literature that focus on costs. These are: (i) Re-run everything; (ii) Minimization / reduction of the test case; (iii) Selection of the test case; (iv) Prioritization of the test case; (v) Hybrid approach. This document focuses on the techniques of prioritization of the test case. Testers may now want to increase code coverage in test software at a faster pace, increase or improve their reliability in software reliability in less time, or increase the speed at which test suites detect failures at that moment. System during the regression tests. The main problems with code-based prioritization techniques are that they focus only on the number of errors detected and, therefore, treat all failures in the same way.

Motivation

Requirement based test case prioritization address such issues by assigning the priority to test cases on requirement coverage based. Major Issue with specification based and requirement based Test Case Prioritization is that there is no efficient.

2. Related Work

Jiahui Qu , Yunsong Li, and Wenqian Dong proposed work on **1.** This paper presents a novel approach for test case prioritization during regression testing of programs that have assertions using fuzzy logic. The main objective of this approach is to prioritize the test cases according to their estimated potential in violating a given program assertion. To develop the proposed approach, we utilize fuzzy logic techniques to estimate the effectiveness of a given test case in violating an assertion based on the history of the test cases in previous testing operations[1].

2.This paper presents an approach to prioritize regression test cases based on three factors which are rate of fault detection [6], percentage of fault detected and risk detection ability. The proposed approach is compared with different prioritization techniques such as no prioritization, reverse prioritization, random prioritization[3].

3. In this paper we have presented the various types of regression testing techniques their classifications presented by various researchers , explaining selective and prioritizing test cases for regression testing in detail. Retest all method is one of the conventional methods for regression testing in which all the tests in the existing test suite are retuned. So the retest all technique is very expensive as compared to techniques which will be discussed further as regression test suites are costly to execute in full as it require more time and budget [4].

4. The objective of this research is to propose "prioritizing factors" that better reflect the real-world scenario for test case prioritization in the specification-based environment: (1) requirement severity score and inter-case dependency, and to optimize the test case arrangement through the application of meta-heuristics. The inter-case dependency can be formulated as a sequential ordering problem (SOP), a NP-complete problem for which the precedence relationship exists[5].

5. performed several new studies in which we empirically compared prioritization techniques using both controlled experiments and case studies. The results of these studies show that each of the prioritization techniques considered can improve the rate of fault detection of test suites overall [6].

6. author proposes a selection schema to support the selection of TCP techniques for a given software project aiming at maximizing the coverage of software project characteristics considering aspect of prioritization of software project characteristics[7].

7. Present The concept of fragmentation and encryption at user side is referred from this paper. This technique provides security at host level, at network level and at cloud server [6].

8. This paper presents a system level, value driven approach to test case prioritization called the Prioritization of Requirements for Test (PORT). PORT involves analyzing and assigning value to each requirement using the following four factors: requirements volatility, customer priority, implementation complexity, and fault proneness. System test cases are prioritized such that the test cases for requirements with higher priority are executed earlier during system test[11].

3. Methodology

A. *Proposed System Architecture*

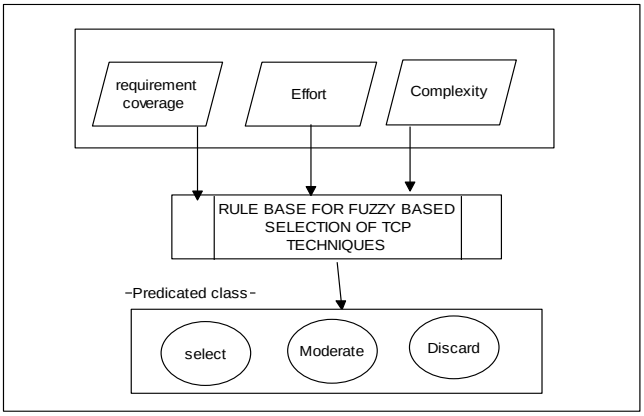

Fig.1: System architecture

B. *System Overview*

Proposed system selection schema and provides a framework for selection of test case prioritization technique based on three Parameter: (i)Requirement coverage, (ii) Efforts and, (iii) Complexity According to survey performed complexity can be taken on the scale of 1-10 usually defined by the developer and analyst.. effort is measure in terms of two in two terms: Final Total effort (FTE) and Average Effort (AE). relevant project attributes/features is done to identify TCP techniques covering maximum project attributes consequently requirements.

The various stages of proposed approach are as follows:
Stage-1 Identifying project features' in terms of relevance and hence coverage of requirements[16].
Stage-2 Identify the complexity of testing techniques.
Stage-3 calculating testing effort
Stage-4 classify TCP techniques using fuzzy inference.

C. *Advantages*

a) 1.Reduce time and cost to select test case
b) 2.Enhance prioritization technique.

PCA:

The Principal component analysis (PCA) fusion method is based on the principal component transform (PCT) that converts an MS image with correlated bands into a set of uncorrelated components. The first component resembles the pan image. It is, therefore, replaced by the HR pan image for the fusion. Before the replacement, the pan image needs to be matched to the first component. The pan image is fused into the LR MS bands by performing an inverse PCT. The algorithm replacing the spatial component of the MS image with the pan image allows the spatial details of the pan image to be incorporated into the MS image. In steps, we can summarize the PCA fusion method as follows:

1. The resampled bands of the MS image to the same resolution as the pan image are transformed with the PCT.
2. The pan image is histogram matched to the first principal component. This is done to compensate for the spectral differences between the two images, which occur due to differences in sensors or acquisition dates and angles.
3. The first principal component of the MS image is replaced by the histogram matched pan image. 4. The new merged MS image is obtained by computing the inverse PCT.

The radiometric accuracy of the first principal component is greater than the radiometric accuracy of the HR pan image. This results in a loss of radiometric accuracy in the pan-sharpened image, when the first principal component is replaced with the matched pan image.

4. Conclusion

Present the system In this research we have proposed a novel based technique for the classification of TCP techniques using Fuzzy Logic. This work is an extension of already proposed selection schema for test case prioritization techniques. Model for selection of test case prioritization technique based on three factors: (i) requirement coverage, (ii) efforts and, (iii) complexity.

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