

## CHAPTER 6

### CONCLUSION AND FUTUREWORKS

The software testing in the SDLC is the most essential one as stated earlier in chapter 1 and it has to be well planned before executing all its activities and testing procedures required for proving the quality of software development. In this regard the reduction of the test suite is to be done when more redundant test cases are available for testing the system. The best test case can be selected by improving the searching pattern or grouping the test cases, as per the taken attribute of test cases. The classification of data can help the data analyst to select a particular representative item which can satisfy the constraints of the problem domain. Hence the classification is applied in software test cases as per their attribute such as 'Reusability' and 'Risk' in order to reduce the test suite and secure the maximum requirement coverage. This classification has been successfully made and experimented by applying the 'Tuned Fuzzy Logic' approach on the test cases, to reduce the test suite using the test cases having highest reusability and low risk in executing.

The reduced suite should have a maximum coverage and it has to provide an optimum result when those are used in the testing. The test cases are taken from the 'Functional Testing' for selected applications and the revisions are made for retesting them in 'Regression Testing'. The initial test suite from the repository will be processed with their past historical performance and the risk factor of those test cases, by considering their cost consumed for previous test. The cost of retesting can be reduced when the acquired test cases which are important for testing the basic functionality and the changes made in the existing one.



The test case or the test suite should give 100% expected result in the software testing. But obviously it could not happen in all the cases. Hence the optimality of the test case should be measured or optimal test suite should be produced to satisfy the problem constraint.

The test case optimality can be measured with the help of optimizing the 'Reusability' of the test cases. Chapter 5 is focused on the application of metaheuristics algorithm in the test suite optimization perspective view. To optimize the 'Reusability' factor, the 'Age' and 'No. Of Versions' of a test case are accounted in this research work. The 'Age' and 'Versions' of a test case are dynamic and these dynamic values can help the problem domain as per the current scenario of the test cases in the initial test suite. The 'reusability' will be optimized when test cases have fallen into the category <Old Age, More Versions> or <Young Age, More Versions>. The test cases fallen in any of those categories can be considered to participate in the test suite finally in 'Regression Testing'. To optimize the result the 'Fine-Tuned Firefly' algorithm from metaheuristics technique is applied and the result is compared with the existing algorithms such as 'GA' and 'ABC' algorithms. The derived result concludes that the 'Fine Tuned Firefly' algorithm can give optimized test suite within a less time consumption to save the energy in 'Regression Testing'.

The benefits of test suite reduction are

- The resource can be effectively used
- Effective Risk Management on Testing
- Effective Human Resource Management
- Effective Cost Management
- Less resource consumption



The advantages of the proposed technique, 'Tuned Fuzzy Logic' in the test suite reduction are listed below.

- Test Case Classification
- Strict Approach
- Reduction of Searching cost

The second algorithm is based on metaheuristics technique 'Fine Tuned Firefly' algorithm and its advantages are given below.

- Test case classification for optimization
- Less time for producing results
- Easy to implement
- Reducing time on searching a test case

The application of test case classification based on 'Reusability' factor is 'Test Case Management' or 'Test Case Repository Management'. The conducted research gives another dimension in the 'Software Testing' domain in organizing the test cases effectively in the repository to minimize the resource for maintaining them in the primary library.

## **6.1 FUTURE WORKS**

The test case reduction should save the efforts in software testing and the reduced test suite should give maximum requirements coverage and maximum fault detection capability. In this regard the requirement coverage using 'Tuned Fuzzy Logic' is to be improved. But the test suite reduction and optimization using 'Fine-Tuned Firefly' algorithm can give a maximum test suite reduction compared to 'Tuned Fuzzy Logic' approach, 'GA' and 'ABC' techniques. The future enhancement is to reduce the searching time for a test case by taking other attributes of test cases, for test case classification and applying advanced searching algorithms.

