CHAPTER-8

CONCLUSIONS AND FUTURE SCOPE OF RESEARCH WORK

8.1. INTRODUCTION

The literature survey has shown that software testing problems has received little attention by the researchers. First, generation of effective test cases is a great challenge for testers. Second testing of each and every statement is also a very crucial step. The present work has dealt with objective function that take dominance relationship between nodes of data flow graph in consideration, therefore reduced the requirement of total test cases for checking each and every statement of program under consideration. The problem belongs to NP hard and hybrid algorithm GPSCA based on GA and PSO is analyzed for the testing problem. Experiments have demonstrated the effectiveness of proposed approach is better than PSO and GA.

8.2. CONCLUSIONS

Some of the major findings from the present research work as follows:

1. The fitness function proposed for software testing confirms to be an effective. It effectively reduces the number of test cases required to achieve 100% coverage.
2. Performance of proposed GPSCA show better results as compared to GA and PSO alone.
3. The main advantage of GPSCA is that it provides a quick solution in less number of iterations.
4. The experiments were carried out on seven real world programs. The results confirm the effectiveness of proposed GPSCA as compared to GA and PSO.
5. The experiments show that proposed GPSCA performs better in generation of distinct test case as compared to GA and PSO search algorithms.
6. Proposed hybrid GPSCA has given excellent results for each of the program. Its performance in small as well as large domains shows that it has both types of search capabilities, local as well as global for fulfilling testing requirements. It is suitable for simple and complex problems. Therefore, proposed hybrid GPSCA is strongly recommended for the problem of test case generation.
8.3. **FUTURE SCOPE OF RESEARCH WORK**

Major findings and conclusions have been reported in the dissertation. However, it can be extended to give more efficient performance.

One major aspect of future work is to develop new crossover and mutation processes. These should be efficient so that proposed search algorithm may be easier, efficient and faster.

The instrumentation of the Software Under Test is done to a large extent but it can be further enhanced. So that it can produce control flow graph and dominance tree automatically and provides dominance tree leave nodes information with path details.

A new approach with this proposed GPSCA may be possible to use this algorithm in parallel because of one of its component i.e. GA. The population can be split into several smaller sub populations. Depending on the method these sub populations can form a new population. The parallel GPSCA may be fruitful in searching of results because these sub populations can explore the search space more thoroughly.